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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 125, NO. 15 OCTOBER 10, 1949

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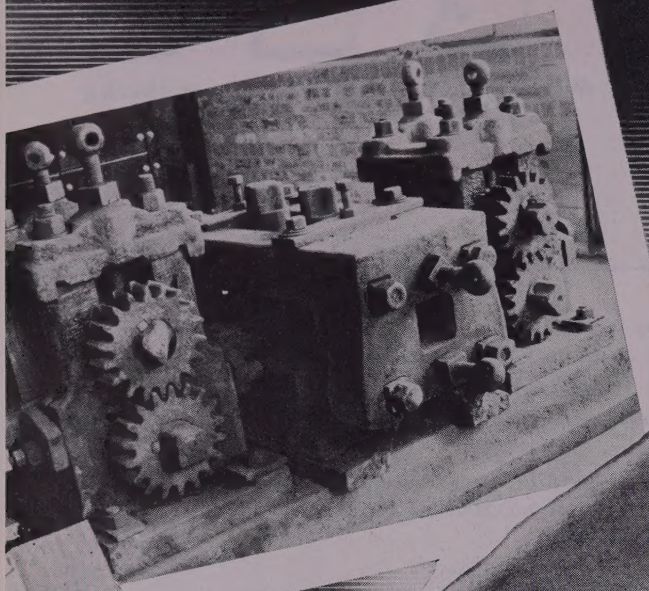
How Do You Measure Progress



Progress in rolling mill design is measured in d
and cents. When a new mill will outdo its
ecessor in output, accuracy and conversion
per ton—that's progress.

The many Morgan mills in operation and u
construction are proof that progress in this fie
measured with a Morgan yardstick. How a
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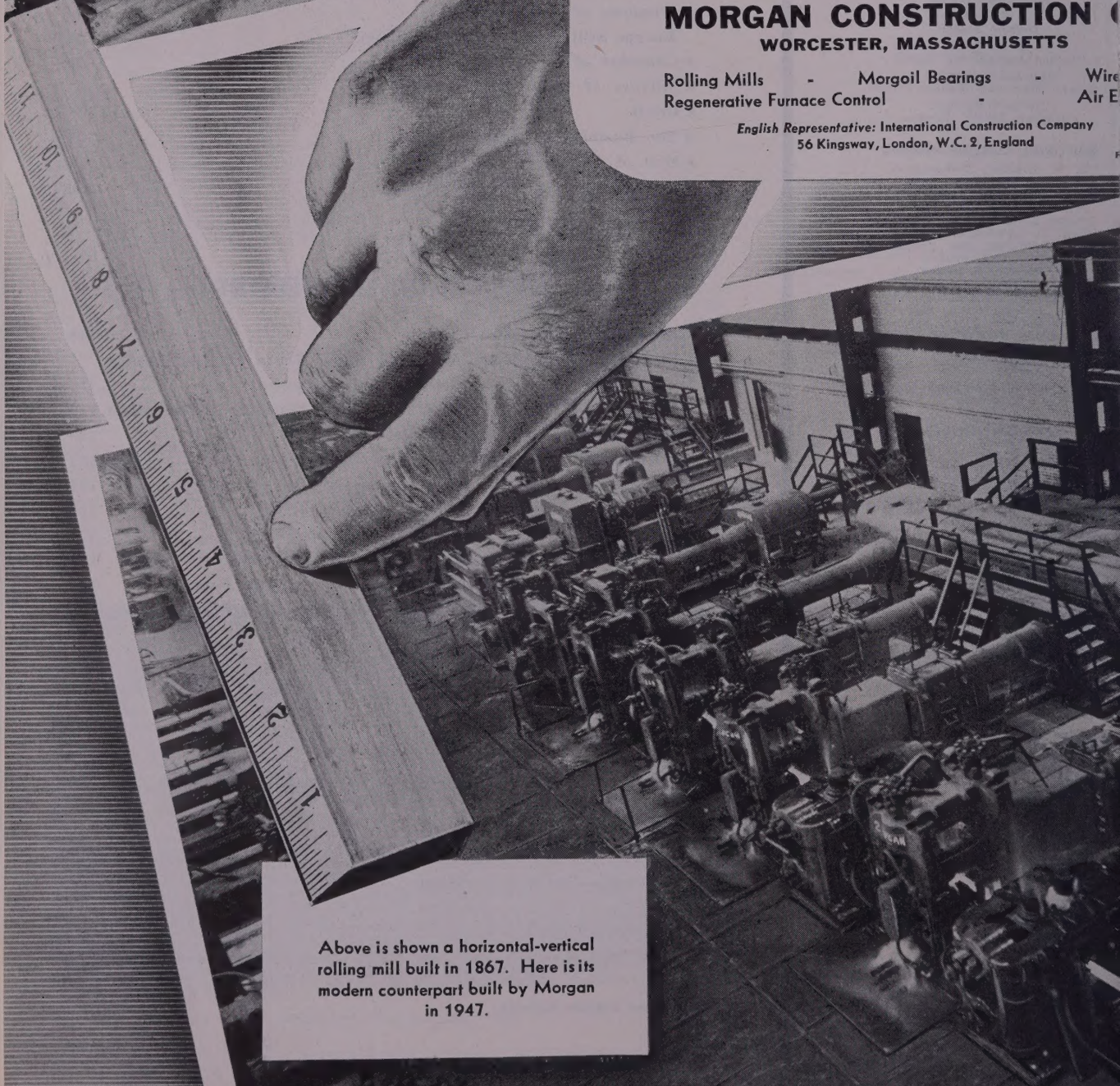
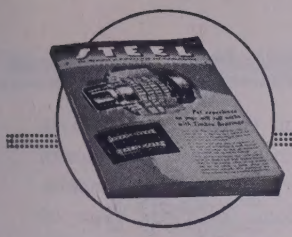


Above is shown a horizontal-vertical rolling mill built in 1867. Here is its modern counterpart built by Morgan in 1947.



October 10, 1949

Food For Thought

Labor unrest during the postwar period, culminating in the present wave of serious strikes, has brought forth a burst of earnest discussion of the basic reasons for the unco-operative attitude of many employees in industry.

Last week the Association of Iron & Steel Engineers held its annual convention in Pittsburgh. Ordinarily at annual meetings of this organization major emphasis is placed upon engineering problems of the iron and steel industry. This year it was noticeable and significant that the two principal speakers stressed human relations rather than engineering problems.

Retiring President C. H. Williams declared that men, not machines, are industry's major problem and that the riddle of human engineering has not been solved. M. W. Reed, vice president engineering, United States Steel Corp., lamented that "we find an increasing number of young men who would rather take a job which they think would provide security than one which they might know would provide opportunity."

These remarks tally closely with observations of Henry C. Jones in an article "What's Wrong With Work?" which appeared originally in "Printers' Ink" and since has been quoted widely. "It is disturbing to observe," wrote Mr. Jones, "how few of our young people know how to work . . . . and how few have any intention of learning. They don't like the idea of work. They just don't want anything to do with it. Yet they want jobs and an income."

Perhaps industrialists, educators and public officials have woefully underestimated the extent to which the impact of two wars has disturbed great masses of people and stimulated their desire for security. Certainly too little intelligent effort has been made to understand the plight of young men who are confused by today's chaotic panorama of senseless economic, social and political paradoxes.

This problem of helping the younger generation to arrive at a more satisfactory outlook toward seeking a worthwhile career in life is important enough to command the concentrated attention of the ablest men in industry. Success in solving this problem might easily pave the way for better labor relations in the future. Conceivably it could spell the difference between preserving our present way of life with its desirable freedoms and descending into the horrible regimentation of socialism or communism.

* * *

PUTS ACCENT ON COSTS: A liberal portion of this issue is devoted to the 1949 Metal Congress and Exposition to be held in Cleveland, Oct. 17-21, under sponsorship of the American Society for Metals. Participating organizations are the American Welding Society, Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers and Society for Non-Destructive Testing.

Since the advent of this annual affair 31 years ago, each year has witnessed a broadening of its appeal to individuals in the metalworking industries. Initially it attracted a group of specialists who called themselves steel treaters. Interest spread gradually to metallurgists and others concerned with the chemical and physical properties of metals. As more and more functions in the production, fabrication and use of metals became closely integrated, the merits of the annual Metal Congress and Exposition were recognized more widely by designers, engineers, operating personnel, manufacturers who use metals predominantly in their products, purchasing agents and many others who are in

(OVER)

dozens of functional classifications dealing with metals.

This year's technical sessions and show assume special significance because present conditions accent economy in production. We have to go back 11 years to 1938 to find a metal congress staged in the atmosphere of a buyers' market. The contrast between materials, parts, equipment, supplies and services now available and those obtainable in prewar 1938 will be a strong incentive for cost-conscious representatives of industry to spend a few days in Cleveland next week. —pp. 116, 119, 120, 147

* * *

EXECUTIVES ARE HARDY: As a reader of the obituaries in this magazine we have been impressed by what seems to be a high proportion of industrial executives who pass away at early ages in the forties and fifties. In common with many readers, we have wondered whether the pressure of executive responsibilities has unduly shortened the lives of men in industry.

To check this hunch we tabulated the ages of the last 200 persons whose deaths were reported in this publication. Of these 200, two died in their thirties, 18 in their forties, 46 in their fifties, 69 in their sixties, 44 in their seventies and 21 in their eighties. The average age at death was 64.2 years.

Consulting various authorities on duration of life, we find that today the figure ranges a little above or below 65 years. Therefore, it would seem that our concern about the seemingly untimely death of industrialists at an early age is unwarranted. The death rate in industry conforms closely to the actuarial mean for all males. —p. 113

* * *

FOR BETTER PACKAGING: It has been estimated that 50 per cent of all productive labor on many products is devoted to materials handling and packaging. If this estimate is even reasonably accurate, then it is easy to understand the rapidly increasing interest in handling and packaging displayed by manufacturers in recent years.

Such interest was apparent last week at a three-day exposition and concurrent technical sessions at Detroit sponsored by Wayne University and the Society of Industrial Packaging and Materials Handling Engineers. Packaging and handling equipment, materials and methods were demonstrated by 90 exhibitors. Typical of the items which attracted inspection was a carton for bolts, nuts, screws and similar small parts which is lower in price than orthodox containers and may save up to 40 per cent in freight costs. Another was a vapor phase inhibitor type of wrapping paper to protect metals and metal parts against corrosion.

Protective function of packaging is getting increasing and well merited attention. —p. 91

* * *

FROM CLASS TO MASS: Television, fastest growing postwar industry, is undergoing an important transformation. By the end of this year facilities for transmitting television programs will serve portions of the country in which about half of the population reside.

By that time there will be approximately 3 million receiving sets in use. Most of these are instruments that were designed for a "class" market—for persons who were willing to pay a fairly high price for a popular new medium of entertainment. The cream of this market has been skimmed and now manufacturers are getting set for a much bigger "mass" market. Improved know how, lower material costs and lower unit costs resulting from greater volume are enabling the makers of receiving sets to offer them at prices that will attract millions of new customers.

Improved programs, better transmitting and receiving facilities and, in a year or so, color should insure a steady growth for television during the next few years. —p. 92

* * *

TIMELY OBJECT LESSON: Now is a good time to compare the record of company by company dealing with unions with that of industry-wide negotiations. Each of the big three in motordom—General Motors, Ford and Chrysler—has a separate contact with UAW-CIO. While each has encountered work stoppages during the postwar period, all three never have been struck simultaneously.

In steel and coal, where government and unions have connived to bring about industry-wide negotiations, a strike usually paralyzes 90 per cent or more of each industry. It is this industry-wide feature which makes the arbitrary power of a John Lewis or a Philip Murray so monopolistic and so objectionable from the standpoint of the public interest.

—pp. 87, 88, 90, 101, 229

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

STRIKES— Brace yourself for a long and costly steel strike, the sixth major one in the industry's history (pp. 87, 88, 89). Management thinks the stoppage may last 30 days or more now that all normal U. S. peace-seeking procedures have been exhausted. A break in the stalemate could come through government assumption of control of struck companies by some legerdemain. Steelworkers are dropping about $35 million weekly in wages, but Uncle Sam is a big loser in loss of tax revenues from corporate and personal incomes. More than a score of steel companies are still operating because they have signed up, their contracts haven't expired or have been extended or they do not have a contract with USA-CIO.

METALWORKING BIG— Worried about how the coal and steel strikes will affect you in metalworking? (p. 90) It's a big worry because the industry is the largest in the U. S. and world. Its more than 50,000 plants employ 5.8 million and have an annual business volume of about $65 billion, three times that of any other industrial group.

HUMAN ENGINEERING—Men, not machines, are your greatest problem, members of the Association of Iron & Steel Engineers heard last week (p. 90). Human engineering is needed to cut the Gordian Knot of strikes, indifferent productivity, discontent. Packaging and materials handling specialists tackled a phase of the same problem at their Detroit meeting (p. 91). They showed how the job of labor—more than half of all production workers are usually employed in materials handling and packaging—can be made easier and more efficient by their equipment and methods.

TELEVISION—Look for an even greater production boom in television sets (p. 92). Producers are gearing for the larger mass rather than class market as costs drop and prices fall. Production techniques are improving; more than 3 million sets may be in homes by Jan. 1.

GOVERNMENT PROBLEMS— The President, the Supreme Court and Congress face a formidable array of tough and controversial problems (p. 94). Mr. Truman has the delicate matter of the steel and coal strikes. The high court is nearly snowed under with about 400 cases on its docket, many of which involve touchy labor questions. Legislators are trying to adjourn by Nov. 1, but they still must act on farm price support, middle income housing, aid to underdeveloped areas of the world and social security.

FOREIGN—Western Europe is still tinkering with its money and trying to adjust itself to devalued currencies (p. 97). Aftermaths of revaluation are hitting Britain and France where the governments are having a difficult time keeping labor satisfied.

OFFICE MACHINES—The greater efficiency of business machines is one of the reasons why U. S. industry can be as big and complex as it is (p. 99). Trend today is for machines with higher speed, greater automaticity and flexibility. To get this, office equipment makers are spending record sums to increase their research and development programs.

HERE AND THERE IN INDUSTRY—Trade talk has it that Ford Motor Co. is placing a $25 million contract with Borg-Warner Corp. to make an automatic transmission (p. 93) . . . Machinery builders are not immediately worried about their steel supply (p. 93) . . . U. S. Steel's Consolidated Western Steel Corp. is building a new pipe mill in Houston (p. 93) . . . Kaiser-Frazer Corp. will get an RFC loan of $34.4 million to retool its plant and expand working capital (p. 101) . . . Sheet Steel Galvanizing Corp., Lonergan Mfg. Co., American Machine & Foundry Co., Victor Equipment Co., Delaware, Lackawanna & Western Railroad and Ford have all acquired or seek to sell properties (p. 104) . . . Metalworking plays an important role in the production of parts for an electric lamp (p. 98) . . Basement workshop enthusiasts are tightening up in their purchases of hobby tools (p. 98).

Engineering News, p. 115 *Market Summary, p. 229*

NEWS SUM SUMMARY

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Watchful Waiting in Steel Strike

Metalworking braced for long, costly dispute. Management talks of stoppage lasting 30 days or more. Normal U. S. peace-seeking procedures exhausted

AMERICA'S metalworking industries are settling back to wait out a long and costly steel strike. Management is talking of a stoppage lasting 30 days or more.

The issue—whether welfare benefits are to be paid entirely by industry or whether employees are to contribute a share—is sharply drawn. Both labor and management are adamant. The government has tried fact finding and mediation and conciliation. All failed to bring peace.

Settlement Possibilities — Management says it will wait until Philip Murray backs down from his ultimatum that industry pay the whole cost for social insurance and pensions —now and in the future. Or, steel men suggest, they will wait until the workers rebel against the loss of paychecks and start a back-to-work movement. The latter is regarded as having a better than ordinary chance. A third possibility is a compromise whereby future increases in pension and insurance costs would be shared.

Union leaders are hoping: 1. Industry will capitulate; 2. President Truman will exercise some legerdemain to get them off the hook.

Seizure Possible—Any action the President may take to end the strike will have to be something special. One such means might be invoking the plant seizure clause in the Selective Service Act. This procedure might resemble that by which the government took over the coal mines several years ago, granted the miners the welfare fund they were demanding, later handed the mines back to the rightful owners with the welfare fund (now virtually bankrupt) a *fait accompli*.

Such action in steel is not expected immediately. If the strike continues 30 days or more and reaches an emergency stage, seizure will become a strong possibility. Under such a move, industry men believe the government administrator would grant the union the noncontributory welfare plans which the owners would inherit when the mills were returned.

Just Waiting—In the first week of the strike, neither side moved toward a settlement. No meetings were held between management and labor negotiators. Government mediators flitted across the scene but came up with no real proposals to resolve the dispute. About 500,000 steelworkers were idle, some 50 steel mills closed.

One good omen: Strike is orderly.

Strike May Spread

Another 500,000 workers in metalworking plants having contracts with the United Steelworkers may be called out within the next few weeks. Mr. Murray has threatened to close these plants unless they agree to his ultimatum for company-paid benefits.

Some metalworking plants already are idle. About 8000 of 80,000 employees of metalworking companies in Pittsburgh district are out.

Contracts of many metalworking companies expire within the next two weeks. Metalworking management generally is expected to resist the company-pay-all pension proposal. If the basic steel industry is still on strike, these companies will figure they soon would be closed for lack of steel anyhow.

Users' Stocks Fair

Nationwide analysis to determine impact of coal and steel strikes on production and employment will be conducted at intervals over the next few months by the U. S. Commerce Department.

By telephone the department will ask representative consumers how long they can operate on their inventories.

STEEL's mid-September survey shows 41 per cent of the reporting consumers could operate from 30 to 60 days on steel in stock (see STEEL, Sept. 19, p. 46). Twenty-one per cent could run 60 to 90 days and 18.5 per cent could go over 90 days. Supply for only ten to 30 days was held by 18.5 per cent of the plants.

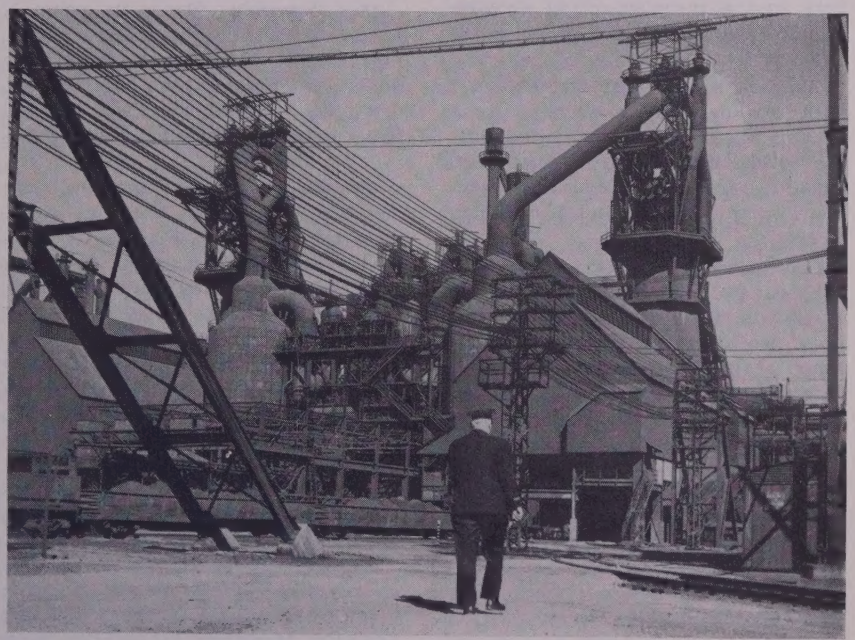
The automobile industry is better fortified with steel stocks than most consuming groups as a result of protective buying in anticipation of the strike.

Coal Stoppage Bothers Murray

John L. Lewis and his coal strike is no help to Mr. Murray. The steel companies' resistance is strengthened by the knowledge that their plants would be idled within a few weeks for want of coal even if the steel strike were settled.

The government entered the coal dispute last week when Federal Mediator Cyrus Ching called Mr. Lewis and the mine operators to a mediation meeting.

Operators in accepting the invitation indicated the next coal contract would eliminate the clause which pro-



LONELY VIGIL AT AN IDLE BLAST FURNACE
. . . Carnegie-Illinois Steel Corp.'s South Chicago Works

vides that miners will work only when "willing and able." Says George Love, spokesman for northern operators: "We will not recognize any contract clause which would leave the way open for Lewis to call work stoppages either nationally or by districts."

Coal shortages are occurring in some sections of the country, although industry generally is comfortably stocked. Steel mills have between 30 and 45 days' supply. Electric utility power plants at the start of the mine strike had a record high of 130 days' supply, 25 per cent more than they had a year ago.

Everybody Loses

Losses by the steel strike run into tremendous figures.

Steelworkers are losing about $35 million weekly in wages. If the strike spreads to metalworking plants with which the United Steelworkers have contracts, the wage loss figure may climb to $70 million weekly.

The wage losses will be felt immediately in every steelmaking center. Not only the workers and their families, but tradespeople, professional men and many others will be affected. Example: In Lorain, O., a grocery-meat store serving employees of National Tube Co. took in only $2 in cash Oct. 1, a Saturday and the first day of the strike. The rest was on the cuff.

Pennsylvania Railroad says the strike will cost the road $10 million in freight revenue in October.

The steel industry's losses will be heavy, but are almost impossible to estimate.

Uncle Sam will be a big loser. Millions in tax revenues—from incomes of individuals and from the corporations—will be lost.

Withholding taxes of a steelworker with two dependents average about $4.90 a week. With three dependents, the withholding is $2.90 a week. Indicated loss to the federal government is between $1.5 and $2.5 million weekly.

Loss in corporation taxes is difficult to estimate. Companies during the strike will incur losses, offsetting taxable profits made earlier. On the basis of industry earnings to date, federal income taxes of the struck companies have been running close to $5 million weekly.

Chrysler Gets New Demands

Chrysler Corp. is studying new demands by the United Auto Workers-CIO, presented after the union won noncontributory pensions from Ford. Negotiations will be resumed Tuesday. Chrysler's contract permits reopening this year only for discussion of wage rates.

This Is Sixth Major Steel Strike

THE 1949 strike is the sixth major one in the steel industry.

In 1892 a big, violent strike occurred at the Homestead, Pa., mill of Carnegie Steel Co. This strike, which started because the company scaled down wages, failed, but not until after seven Pinkerton agents and 11 strikers were killed.

In 1909 the old Amalgamated Iron, Tin & Steelworkers union collapsed after a 14-months strike.

In 1919 and 1920 William Z. Foster, now chairman of the American Communist Party, led an unsuccessful drive against Big Steel's open shop policy. In the three-months strike more than a score were killed.

In 1937 the violent "Little Steel" strike occurred, as Bethlehem, Republic, Inland, and Youngstown Sheet & Tube resisted the organizational drive of the then newly formed CIO Steelworkers Organizing Committee. Ten strikers were killed at Chicago. The companies did not capitulate until 1942.

In 1946 the entire steel industry was closed by a strike of the United Steelworkers-CIO for their first postwar wage increase. After a four-weeks strike the union got a pay increase of 18.5 cents an hour. There was no violence.

More Than Score of Plants Continue To Operate

SOME steel plants continue to operate even though the bulk of the industry is shut down by the 1949 steel strike.

Reasons for continued operation fall roughly into four groups: 1. Companies have agreed to meet demands of United Steelworkers of America—CIO; 2. contracts with USA—CIO have not expired; 3. contracts with USA—CIO have been extended; and 4. USA—CIO does not have contract.

More than two dozen companies producing steel were operating last week, the Pittsburgh office of the United Steelworkers reports.

Met Demands—Plants in group 1 include Portsmouth Steel Corp., Portsmouth, O., John A. Roebling's Sons Co., Trenton, N. J., and Kaiser Steel Corp., Oakland, Calif., which have concluded agreements with USA—CIO.

Several companies operating under agreement to go along on whatever pattern is established with United States Steel Corp. are Firth Sterling Steel & Carbide Corp., McKeesport, Pa.; Granite City Steel Co., Granite City, Ill.; Laclede Steel Co., St. Louis; and Struthers Iron & Steel Co., Struthers, O. Copperweld Steel Co. reached an agreement with the United Steelworkers for its Glassport, Pa., plant but refused to sign for the Warren plant. All of that company's facilities were struck by the union.

Unexpired Contracts — Companies in group 2 include: Allegheny Ludlum Steel Corp., Pittsburgh, Empire Steel Co., Mansfield, O., and Braeburn Alloy Steel Corp., Braeburn, Pa. Timken Roller Bearing Co., Canton, O., concluded an agreement with the United Steelworkers last summer and is operating. The United Steelworkers contract with Alan Wood Steel Co., Conshohocken, Pa., does not permit a reopening of it this year.

Contracts Extended—In group 3 are Carpenter Steel Co., Reading, Pa., operating on a 24-hour strike notice basis; Heppenstall Co., Pittsburgh, whose contract was extended to Oct. 11; Jessop Steel Co., Washington, Pa., Latrobe Electric Steel Co., Latrobe, Pa., and Woodward Iron Co., Woodward, Ala., whose contract extensions permit the United Steelworkers to strike on ten days' notice; McLouth Steel Corp., Detroit, Interlake Iron Corp., Cleveland, and Pittsburgh Coke & Chemical Co., Pittsburgh, whose contract extensions permit the USA—CIO to strike any time it chooses; and the Stanley Works, New Britain, Conn., whose contract was extended in August.

No USA—CIO Contract — Companies in group 4 include: Weirton Steel Co., Weirton, W. Va., which has an independent union. Armco Steel Corp.'s plants with independent unions are not struck, but its Ashland, Ky., and Rustless Iron & Steel Division, Baltimore, having contracts with the USA—CIO are struck. Ford Motor Co.'s steel division is organized by the United Automobile Workers—CIO. International Harvester Co.'s Wisconsin Steel Works, South Chicago, Ill., Texas Steel Co., Ft. Worth, Tex., Vulcan Crucible Steel Co., West Aliquippa, Pa., and Lone Star Steel Co., Dallas, are not

covered by a United Steelworkers contract. The United Steelworkers Pittsburgh office has no record of contracts with Sloss-Sheffield Steel & Iron Co., Birmingham, Henry Disston & Sons Inc., Philadelphia, and Midvale Co., Philadelphia.

Exports May Be Held Up

To conserve stocks of steel in the United States, the Office of International Trade may hold up applications for licenses to export the material. The OIT hopes, however, that exporters will exercise restraint and not seek licenses during the strike.

Exports of finished steel during the first seven months of 1949 were in excess of 6 per cent of production, for mills alone exported 6 per cent, and in addition to that were exports by warehouses and others. Finished steel exported by mills in the first seven months totaled 2,243,455 net tons.

Metalworking companies also are taking precautionary steps to conserve steel supplies: Westinghouse Electric Corp. instituted a rationing system on all major appliances. The company says it has enough steel for full appliance production through October but that it will have to start cutting back Nov. 1 if the strike continues.

Maytag Co., Newton, Iowa, manufacturer of washing machines, says the steel strike is forcing it to eliminate overtime work for more than 000 employees at its No. 1 plant.

School for Supervisors

SCHOOL DAYS are here again for hundreds of supervisory employees of Republic Steel Corp. plants.

Instead of letting time go idly by during the steel strike, the company in each of the cities in which it operates is conducting classes where supervisory employees, not on strike but kept away from work by the strike, can enter into study and discussions, which they do not have time for when their plants are operating. Classroom topics are plant problems and work procedures. The program includes lectures by company officials and motion pictures.

The classes are under the immediate supervision of the company's district industrial engineers, directed by Henry M. Metcalf, newly appointed chief industrial engineer for the company.

Lake Shipping Nipped

Like a heavy premature frost, the steel strike nipped iron ore shipments on the Great Lakes almost two months ahead of normal closing. Shipping men say that if the strike continues past the middle of October, the lake ore movement for this year is virtually over.

Stocks at the mines have been exhausted. Even if the strike ends within the next week or so, considerable time would be required to get the mines in production. Meanwhile, shippers would be working against the weather.

Furnace Stocks Comfortable—Ore men are not too concerned over the enforced early closing. Stocks of ore at lower lake docks and furnaces Sept. 1 totaled almost 41 million tons. Consumption during recent months has been running between 5 and 6 million tons monthly. Ore men believe stocks will be sufficient to carry through to the opening of the 1950 season.

Ore shipments to Oct. 1 totaled 66.7 million tons.

Coal Needed—Coal shipments to the head of the lakes have been below normal and some stringency is expected there.

Lake shippers who shift from the ore to the grain trade late in the season will be inconvenienced.

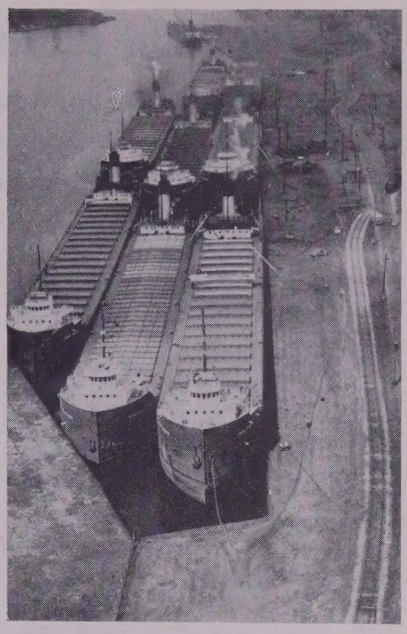
Warehouse Business Brisk

Business became brisk at steel warehouses as soon as the steelworkers' strike began.

The swollen volume of demand was reminiscent of the steel shortage period which ended early this year. In the upsurge, warehouses are getting inquiries and offers of orders from areas far out of their normal business territories. Cleveland warehouses, for instance, received inquiries last week from Alabama, Tennessee and Kentucky.

Some Struck—In some areas the warehouse distribution pattern is disrupted by strikes at warehouses where the United Steelworkers of America—CIO had contracts. Among those closed were United States Steel Supply Co. warehouses at Pittsburgh, Chicago, Boston, St. Paul, and Newark, N. J., and the Pittsburgh and Boston shops of Joseph T. Ryerson & Son Inc.

If the steelworkers' strike lasts long, strike-generated demand for warehouse steel will fade away perhaps before the stocks of it are exhausted, warehousemen say, for consumers may find it necessary to curtail operations for want of other materials and components choked off by the strike. Warehouses had good and well-balanced stocks at the beginning of the United Steelworkers' strike.



TIE-UP: Nine loaded ore boats, bound for steel mills at Gary, Ind., and South Chicago, Ill., with iron ore from the Mesabi range tie up in Milwaukee harbor. More are expected. Reason: Strike. NEA photo

West Coast Strike Ends—A boon to West Coast metalworking companies is settlement of a three and one-half month warehousemen's union strike against 172 warehouses in the San Francisco area. About half of the region's steel warehouses had been affected by the strike, and reopening means release of a large amount of steel products. This is expected to help offset, for awhile at least, the national steel strike's restrictive effects on consumers in the San Francisco area. Settlement was based on agreement by the union to accept a 10-cent-an-hour wage increase.

Steel Payroll Increases

Although employment in the iron and steel industry declined in August from July, the industry's estimated total payroll for eight months of 1949 was $69 million larger than in the corresponding period of 1948, American Iron & Steel Institute says.

The estimated total number of employees was 603,000 in August, a decline of 6500 or 1 per cent from July. The number of wage earners in August was 508,200. Average payments to wage earners in August was $1.682 an hour, compared with $1.699 in July and $1.689 in August, 1948. Wage earners worked an average 36.5 hours a week in August, an increase of 4.7 hours over the July average. The estimated payroll of the industry in the first eight months of 1949 was $1,496,980,000.

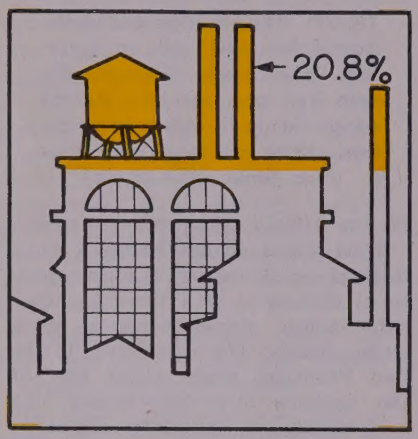
Metalworking World's Largest Industry

About 50,000 plants could be affected if paralysis from the steel and coal disputes spreads. It employs 5.8 million and has a $65 billion annual sales volume

IF PARALYSIS from the steel and coal strikes spreads to all the metalworking industry, what could be affected?

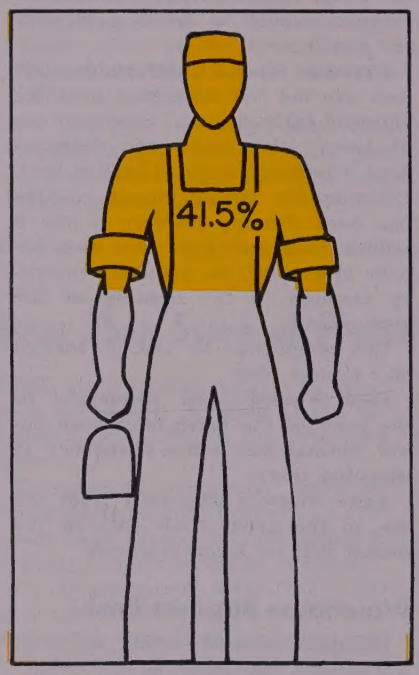
Bureau of the Census figures show that metalworking is the world's largest industry. It is employing more men and has a greater sales volume than any other industrial category in the United States.

There are about 241,000 manufacturing establishments in America. Of these, 50,000 or 20.8 per cent are metalworking as shown in this chart.



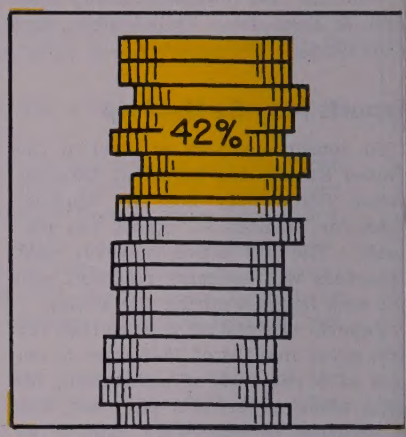
These 50,000 make six general classifications of products: About 5400 produce primary metals; 16,800 fabricate metal products; 17,900 make machinery except electrical; 3900 manufacture electrical machinery; 3700 turn out transportation equipment; 2600 make instruments and related products.

The 241,000 manufacturing establishments employ about 14.3 million annually. The metalworking industry hires 5.8 million of these or 41.5 per cent, as the chart below indicates.

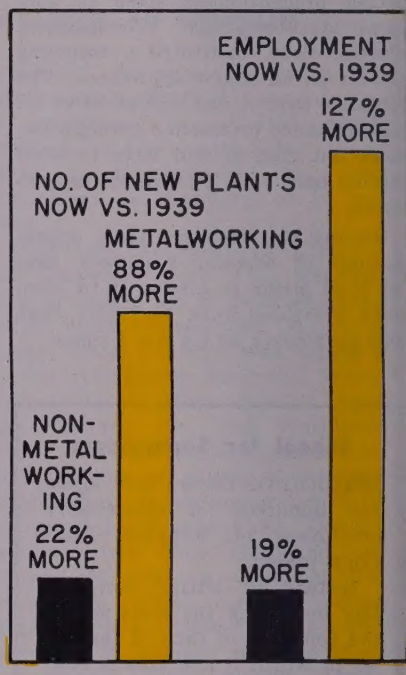


Primary metal producers employ 1.2 million; metal product fabricators have 950,000 employees; makers of machinery except electrical have 1.5 million workers; electrical machinery manufacturers employ 801,000; 1.2 million have work in the transportation equipment industry; 230,000 are employed by makers of instruments and related products.

Estimated annual sales of all manufacturing now totals about $154.' billion. Metalworking companies account for $65 billion of this or 4' per cent, as shown in this chart.



Relative rates of expansion since 1939 for nonmetalworking and metalworking industries are indicated below.



Men, Not Machines, Are Industry's Major Problem

MEN, not machines, are industry's major problem. The human engineering riddle has not been solved, stated C. H. Williams, president of the Association of Iron & Steel Engineers, in opening the group's strike-clouded annual convention at Pittsburgh Oct. 3-6.

Mr. Williams believes that another subject about which industry has much to learn is conservation of national resources.

Trips Canceled — Inspection trips originally scheduled at the Irvin Works of Carnegie-Illinois Steel Corp. and the Aliquippa Works of Jones & Laughlin Steel Corp. were called off because of the strike. The labor walkouts in steel also held the attendance at the meeting to slightly below normal. Principal speaker was M. W. Reed, vice president of engineering, U.S. Steel Corp.

He said the nation has fallen behind by an estimated $80 billion worth of new or replaced facilities, and as one result the present annual rate of increase in productivity is estimated to be from 30 to 50 per cent below what it could have been.

Reason for this, he explained, has been the precedent-taking desire for comfort and security rather than technical progress or opportunity, the underlying causes being an increased number of old people in the nation and a sense of insecurity because of two world wars.

The Kelly Award of $300 for the best paper presented in 1948 before the association went to A. H. Arbogast, combustion engineer, Bethlehem Steel Co. His title was "Quantitative Determination of Dust in Gas." Second prize of $200 was awarded to E. C. McDonald, chief combustion engineer, Republic Steel Corp. Third award of $100 went to

. E. Beynon, superintendent of roll
ıops, Carnegie-Illinois, South Chi-
ago, Ill.

Next year's meeting will be in
leveland, Sept. 26-29, to be held in
onjunction with the iron and steel
ıow at the Public Auditorium.

New Officers—New officers of the
ssociation to serve in 1950 are:
resident, A. S. Glossbrenner, assist-
ant vice president of operations, Youngstown Sheet & Tube Co.; first vice president, J. F. Black, Buffalo; second vice president, I. N. Tull, electrical superintendent, Republic; treasurer, J. L. Young, vice president in charge of engineering, National Tube Co.; secretary, E. L. Anderson, electrical superintendent, Bethlehem Steel.

Packagers, Handlers Get a Lift

Detroit exposition highlights equipment and methods to make more efficient the 50 per cent of all productive labor usually employed in handling, packaging

HORT cuts to economy are offered
y materials handling and packaging
ecialists. Their equipment and
ethods promise to make more effi-
ent the 50 per cent of all productive
bor usually employed in materials
andling and packaging.

This was evidenced at a three-day
xposition in Detroit last week de-
oted to industrial packaging and
aterials handling and at the con-
ırrent technical sessions dealing
ith these subjects. Sponsors were
Vayne University and the Society of
ıdustrial Packaging and Materials
andling Engineers. The exposition
as the fourth annual event of its
nd and the largest. Over 92 per
ent of Convention Hall's area was
sed by 90 exhibitors.

Wide Range of Displays—Displays
ın the complete range from large
ıdustrial trucks, hoists and conveyor
nits, down to wiring and strapping
achines, hundreds of different types
f containers and protective wrap-
ng materials. Automatic Transpor-
ıtion Co., Chicago, showed a new
000-pound, high-lift fork unit, cap-
ble of handling loads up to 3000
ounds. With a lift of 118 inches,
is designed for use in older plants
here floor loads are limited. Con-
entional trucks of this capacity
eigh up to 6700 pounds.

Power strapping machine of Sig-
ode Steel Strapping Co., Chicago,
electrically operated with binders
ıtomatically and adjustably ten-
oned to permit complete sealing of
ne strap in 5 seconds. To facilitate
nloading of trucks at dock wells, a
ydraulically controlled platform was
nown in operation by Gordon, Kin-
ey & Staninger, Detroit representa-
ve of Rowe Methods Inc., Cleve-
nd. The platform adjusts itself
ıtomatically so that it is always
ush with the truck floor. In one
ıtomotive plant where eight truck
eceiving wells were installed, it was
ossible to eliminate five by using this self-adjusting platform.

Packaged Savings—In the packaging field, one development is the Belsinger box, a three-piece stapled corrugated square box designed for shipment of bolts, screws, nuts and similar small parts ordinarily packed in kegs and wood boxes. Savings in cost of the container over kegs are estimated to exceed 10 per cent, while reduction in freight costs may run as high as 40 per cent.

VPI (vapor phase inhibitor) type of wrapping paper has many potential uses as a protection against corrosion. It is an outgrowth of wartime research to protect overseas shipments of military equipment. A chemist with Shell Development Co. in California originated the chemical which is used to treat a protective Kraft paper. First licensee of Shell to produce the "VPI wraps" was Angier Corp., Framingham, Mass. Many companies—including General Motors and Ford — with corrosion problems in shipment of iron, steel and aluminum parts and products use the new medium, and others have initiated studies of its possibilities.

Benefit to Labor and Management—R. F. Weber, general supervisor of materials handling research at International Harvester Co., emphasized that engineered packaging and materials handling benefits both management and labor. He gave one of the 12 technical papers at the institute sessions conducted by Wayne University. Typical improvements made in Harvester's materials handling include movement of wire-bound products by lift truck without a pallet and use of containers which can be automatically filled and sealed.

Palletized expendable tier packs are being used profitably by AC Spark Plug Division of General Motors for shipment of automotive fuel pumps from Flint, Mich., to a number of car manufacturers. As described by J. E. MacArthur of that company, there are three general types of expendable pallets in use. The first is formed by gluing cartons on a slip sheet. Special fork trucks, equipped with hydraulic push-pull arrangements, grasp the edge of the sheet, pull it onto the forks and transport the load.

Fragile Parts Protection—The second type has assembled interior partitions located in tubes, trays or cartons. When properly banded or glued on either a wood or paper pallet, they give protection for parts containing glass or fragile sections. The third arrangement is a strong wood pallet, but with a comparatively weak superstructure consisting of half slotted cartons and a cover or tray covering each. Tapered tubes and telescoping trays are a variation. This style performs best with parts which are strong in themselves, lending strength to the pack.

The latter is the type used to ship AC fuel pumps, and because of the greater weight of the pack over former methods, it has been possible to eliminate practically all individual protection, despite glass bowls, protruding rocker arms, soft metal air domes and machined surfaces. AC now is using about 4000 palletized tier packs a month, believes it has only started to realize the potentials in the method.

Public Could Solve Steel Strike

PUBLIC opinion will play a vital part in arriving at the steel strike's solution.

So declared Edward L. Ryerson, chairman, Inland Steel Co., at the regional technical meeting of the American Iron & Steel Institute in Chicago last Thursday. "We have been able to interest the public and get across some of the facts better than ever before," but he added that the public is still "very much at sea" about many of the aspects of the dispute. Until full understanding comes generally, he said, the problems will be very difficult to solve.

Walter S. Tower, AISI president, re-emphasized the strengthened position of the industry in the eyes of the public. "Our public relations problem in latter weeks has been handled more effectively than ever before," he said.

In reviewing the growth of the steel industry, Mr. Tower said that for the decade ending next December between 610 and 620 million tons of rolled steel products will have been produced. Best previous decade was the 1920s in which 353 million tons were made. In only eight of the last 50 years has the industry been able to operate at over 90 per cent.

TV Sales Upsurge

Helped by lower material costs, streamlining of production techniques, higher labor productivity

AMERICA'S television screen is looming bigger and brighter — but without color, at least for the present.

After a four month dip, producers expect a big mass market as production costs drop and prices are cut. They are booming cheaper, mass-produced tubes, built-in aerials, "Channel-eye tuning," "Unipanel control," "Gyromatic picture lock," wider selection of sets, new chassis (Admiral Corp. is making one entirely of plastic) and longer production lines.

Helping move television from a "class" market into a "mass" market have been improved know-how, lower material costs and lower unit cost brought about by volume output and streamlining of mass production techniques.

Color? — This week the Federal Communications Commission is refereeing the struggle between the color-now and anti-color-now groups in Washington. Radio Corp. of America unveils its color system for the first time publicly this week. Last week the Columbia Broadcasting System showed its system to FCC. Both companies want to give the public life-like hues on its television screens soon.

Emerson, Philco and Du Mont want color kept in the laboratory for the time being. FCC might come to a decision about it early next year.

NEW JERSEY LANDMARK
. . . WOR's TV transmitting tower

COLOR CONVERTER
. . . CBS bid for life-like hues

In the meantime if you are worried about your present set going obsolete, you can take heart from the FCC promise that sets now in use will not be outmoded: Ultra high frequency (UHF) stations for color-casting will not be available for about a year even if FCC gives color television the green light.

Grows and Grows—But the nation's fastest growing industry seems not disturbed by the color question: It expects that more than 3 million sets will be in homes by Jan. 1, 1950. By that time half the people in the country will be watching television programs—on their own or their neighbors' sets.

Television receiver output in August reached a new high following a summer decline, Radio Manufacturers Association reports. RMA members reported manufacture of 185,706 sets in a five week period, Aug. 1 to Sept. 2. Total industry production is estimated to top 200,000 sets.

Since the first of the year an estimated 2 million receivers have been made and shipped by all television manufacturers.

Sets produced in the first half of the year slightly exceeded production in all of 1948. One company official predicts sale of sets in the last half of this year will exceed 1.5 million.

Costs Are Lower—A STEEL survey of the television picture reveals that recent declines in sales prices were results of: Lower material costs of tubes, transformers and steel; higher productivity of labor; better tooling; and reduction in components.

Allen B. Du Mont, president of Allen B. Du Mont Laboratories Inc., Passaic, N. J., says the declines were primarily due to overproduction of television sets. He believes that the FCC freeze, now in effect for about a year, had prevented opening up of new markets which would have taken care of the output. Now like other producers, he expects the fine sales trend to continue. Says he: "We ar over-sold at present and are alloca ting merchandise."

Emerson Radio & Phonograph Corp New York, returned to allocation after more than a year without them President Benjamin Abrams, wh says his company produces more tha 1000 sets daily, expects Emerson t produce 1500 to 1600 shortly.

Admiral Corp., Chicago, one o television's "Big Three," (others ar RCA and Philco) can produce 60,00 sets per month at peak production Two years ago the company did no even manufacture TV receivers. It spectacular rise has helped plac Chicago as the top-ranking televisio manufacturing center in the U. S About half of all TV sets are mad in Chicago.

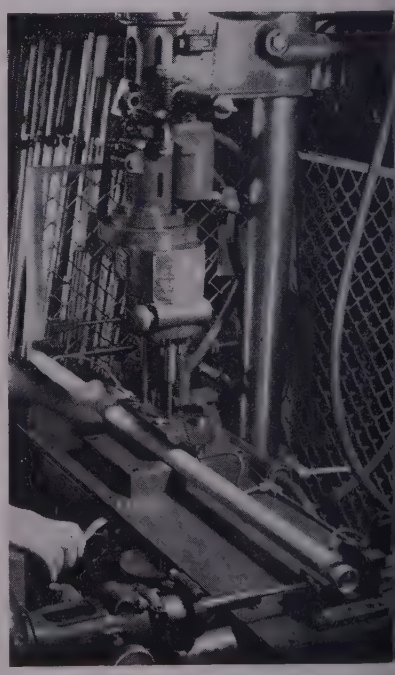
New $1 Million TV Plant

Philco Corp. has started productio of television receivers in a new mil lion-dollar plant in Sandusky, O. Wit addition of these facilities to Philco' Philadelphia plant, president Willia Balderston says the company has th capacity to produce 18,000 receiver per week.

The Sandusky plant, he says, ha the longest conveyors for manufac turing TV sets. Production flow along a single floor on which are in stalled the latest in manufacturin and testing equipment.

J & L "Perma-Tubes" for Vide

A production line unique in th television industry has been set u for output of television antennas a



J & L PERMA-TUBES
. . . for television antennas

the Ashtabula, O., plant of Ward Products Corp., Division of Gabriel Co.

Geared to make thousands of its "Minute Man Series" antennas daily, the line uses specially designed jigs, machinery and material handling methods for high-speed production. Part of the line includes equipment to process "Perma-tube," a rust resisting electric weld steel tubing produced by Jones & Laughlin Steel Corp. Permatube is used for antenna masts and cross arms.

Shades of Dick Tracy

Television has its industrial and commercial applications as well as entertainment and educational values.

One of the latest to be demonstrated is a video night watchman that sees in the dark and never sleeps. How? A fixed television camera is aimed at a safe, gate or door which is illuminated in infra red light which doesn't register on the human eye but does on the orthicon TV camera. It transmits a sharp, clear picture to a central location, say a police station.

B-W May Build Ford Transmission

PLACING of contract for $25 million with Borg-Warner Corp., Chicago, for production of an automatic transmission for Ford Motor Co. was indicated in reports circulating in Windy City trade circles last week. Tooling for the project is said to be already under way. No confirmation was available from Ford. There were hints at disclosures for this week.

Borg-Warner, through its Detroit Gear Division, currently is equipping a Detroit plant for production of an automatic transmission for Studebaker, slated to be in production around yearend. Presumably the Ford project will take longer.

Ford's Lincoln Division now is offering as optional equipment the Hydra-Matic drive developed originally by General Motors. The new Borg-Warner project undoubtedly involves a Ford transmission, particularly in view of the fact Chevrolet will offer a similar device on its 1950 models.

A few years ago, Ford was actively working with the Detroit Gear Division of Borg-Warner on a transmission project, but the deal was abruptly dropped.

Recently a small group of newspaper men visited the Ford test track and was given the opportunity to test various types of transmissions, including Hydra-Matic, Dynaflow, the Detroit Gear job slated for Studebaker, and one which was described as the "Belwood," a Borg-Warner design destined for Ford use.

Steel Supply No Problem

For machinery builders barring a long strike. Higher costs may bring shifts in methods

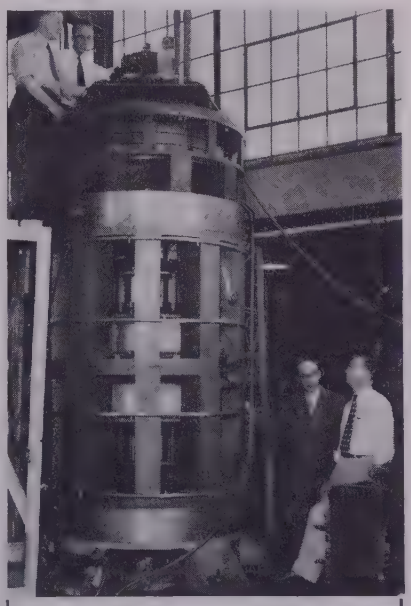
MACHINERY builders are not immediately worried about their steel supply. Stocks on hand are adequate or can be obtained from warehouses. Current operations are not at very high rates and will not eat up inventories unless the steel strike drags on for a long period.

This does not mean that the strike isn't causing furrowed brows. An increase in the price of steel and pig iron may accelerate the trend toward production methods that require minimum machining. The trend is not new. Many metalworking companies have been redesigning their products for some time so they are forged, cast or stamped in what is very close to the finished form. Only one or two precision finishing operations are necessary to finish the job.

Some Will Lose—Higher raw materials costs and fanning out of pension and insurance plans to other companies in the metalworking field will give added impetus to this trend. Cost cutting will take on added weight and certain machine tool lines will find their markets reduced. Conversely, press builders may find a growing market.

So far the strike has had little effect on machinery builders. The only shipments that have been held up are those going to basic steel producers. One builder of pipe threading and cutting machinery doing business with steel producers says his company will continue working on backlogs up to the limit of its storage capacity. There is the joker. In this case the company lacks facilities to store completed machinery should strike settlement be slow in coming.

Several companies are trying to get customers to review long-term needs now.



LOW VOLTAGE: This homopolar generator is capable of delivering 21,000 amperes at 18.7 volts. Made by Electric Products Co., Cleveland, it will be used by Carnegie Institute of Technology to probe more deeply the secrets of nuclear physics. Very little change in this model would make it suitable for electrotinning, electroplating, etc.

U.S. Steel Builds Texas Pipe Mill

A PIPE dream is becoming reality in Texas. Consolidated Western Steel Corp., a U. S. Steel subsidiary, has begun construction of a new electric-welded steel pipe mill in Houston.

This action parallels steps taken by A. O. Smith Corp. and Sheffield Steel Corp. (see STEEL, Oct. 3, p. 45) to build a pipe mill in Houston near the center of oil and gas production.

Consolidated Western has already begun preliminary construction on property near the Houston ship channel. The plant may be in operation next spring to produce 100,000 tons of 24-in. diameter and larger electric welded and expanded steel pipe annually. Consolidated Western will be able to compete in the Texas area, particularly in the market for long-distance oil and gas lines. The new plant's capacity will be about 50 miles of large-diameter pipe a month.

At present U. S. Steel has no facilities for production of this type of pipe east of the Rockies and south of the Pittsburgh area.

Rolling Equipment for Sale

ROLLING mill facilities and auxiliary equipment of Steel Producers Inc., Toronto, O., has been ordered for trustee's sale by U. S. District Court for western Pennsylvania. The hearing and sale will occur on Oct. 14 in the Federal Bldg., Pittsburgh, subject to approval and confirmation by the court.

In the period of acute flat-rolled steel shortage the company leased a portion of Follansbee Steel Corp.'s Toronto, O., plant, but never achieved commercial production. Facilities include one 3-high Lewis breakdown mill, two 2-high hot finishing hand mills, plus reheating furnaces, etc.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Washington looks for "hot time in the old town" as the President, Supreme Court and Congress face an unusual array of tough and controversial problems

FALL has brought welcome relief from the abnormally hot summer but Washington has cooled off only as far as the weather is concerned. New problems have appeared and many old ones have become more pressing. Result: There are many hot spots in the government.

Hottest of them is the White House, once more in the unenviable position, of having to decide what to do about strikes, mainly the steel strike. The betting is that the President will seize the steel plants, give the steelworkers' union what it wants, and return the steel plants to their owners. But, would the steel managements then refuse to accept such a settlement? The whole thing is touchy—particularly with important elections coming up next year. In the meantime, Cy Ching's Federal Mediation & Conciliation Service is in touch with both sides and reporting to the White House.

Hot Spot No. 2—Another hot spot is the Supreme Court which this year is faced with some tough issues. Of the 400 appeal cases on its dockets, many involve labor questions, such as constitutionality of the anticommunist affidavit; union liability for breach of contract; right of the wage and hour administrator to examine company books; legality of certain closed-shop agreements; constitutionality of the Arkansas "right-to-work" law; whether a veteran's right to re-employment ends with the first year of re-employment; whether John Lewis should be purged of contempt and fines of $1,400,000 against the United Mine Workers and $20,000 against Mr. Lewis rescinded.

Hot Spot No. 3—The third important hot spot is Congress, which seeks to end its long grind no later than Nov. 1 and still has considerable work immediately ahead. In addition to acting on bills now in conference, it proposes to pass a farm support bill, the so-called "middle-income" housing bill, bills to implement the program of assistance to underdeveloped areas of the world, and the House leadership wants to act on the social security and public assistance bill now to enable the Ways and Means Committee to concentrate on tax legislation next year.

Congress will continue to be a hot spot in 1950. Here are some of the measures slated for attention starting in January: Veterans' pension increase bill; omnibus ship subsidy bill; federal aid to education; federal aid for building hospitals; the national health bill often alluded to as "socialized medicine;" advance planning of public works; postage rate increases; oleomargarine tax repeal; antimerger bill; St. Lawerence seaway; repeal of many excise taxes; anti-pollution bill; a comprehensive new patent law bill; establishment of a National Science Foundation; a civil rights bill; a bill to encourage economic expansion with government financial and other government assistance; establishment of a Columbia valley authority, etc.

Defense Is Hot Topic—One of the hottest subjects before Congress, now and next year, is the knowledge that an atomic explosion took place in Russia. The whole subject of national defense and national security, including atomic research, will get a more thorough going over than at any time since the war and appropriations under these heads will be granted on a fully adequate basis no matter what the cost.

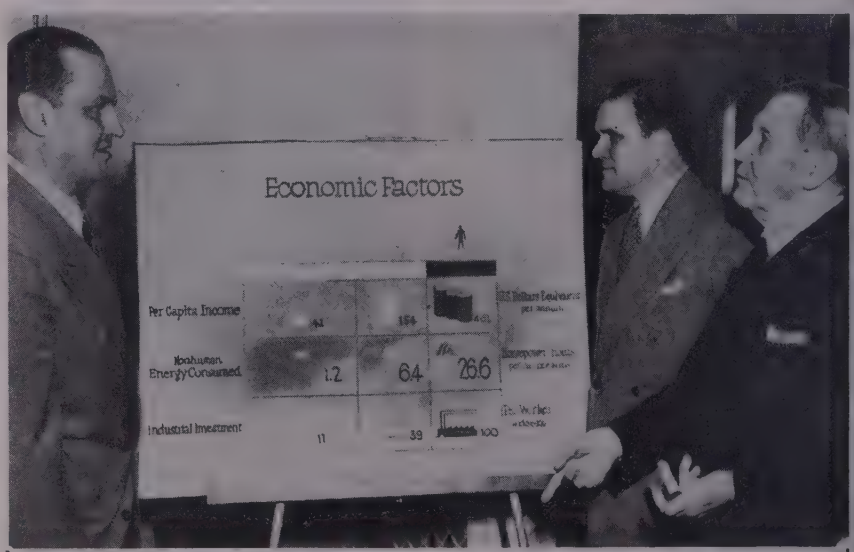
That one-time "hot" subject, the Taft-Hartley Act repealer, is not expected to be taken up any further by the 81st Congress. Proponents of the repealer have decided they did all they could in this Congress and that the best course is to carry the issue to the voters again next year.

New Bill for FEPC

THE ADMINISTRATION'S bill to establish a Fair Employment Practices Commission has but slim chance of passage at this session of Congress. Some of the props were knocked from under this measure by the Senate Labor and Public Welfare Committee's decision to report it without comment.

Opponents of the administration bill found further cheer in the introduction by Sen. Robert A. Taft (Rep., O.) of a bill which probably would receive much greater acceptance. Through his bill, persuasion and education, rather than force, would be relied up to achieve fair employment practices.

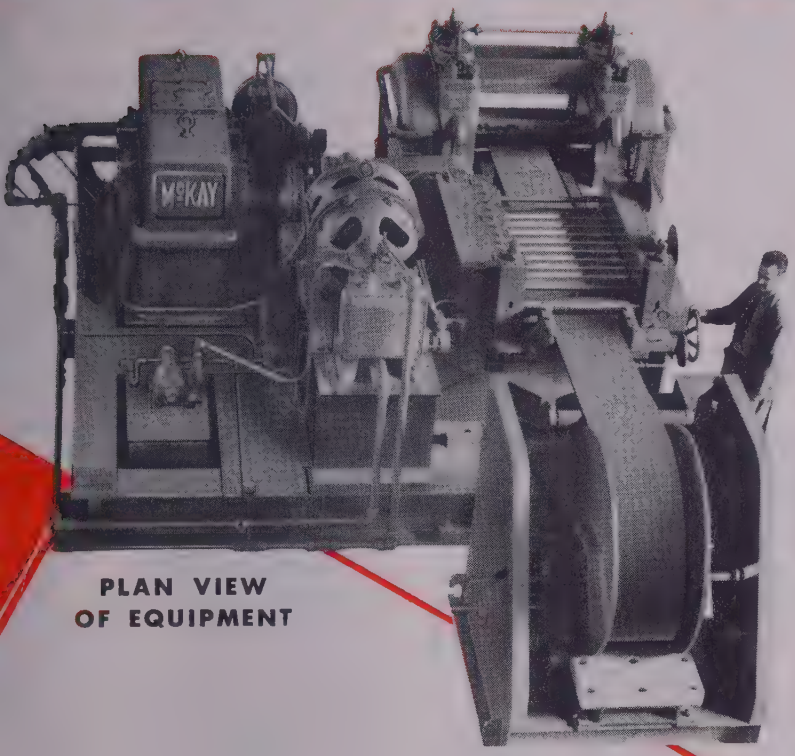
Few people realize how extensive are the compulsory provisions in the administration bill, says Senator Taft in introducing his substitute measure. "They are modeled on the unfair



POINT FOUR PICTURE: Acting Secretary of State Daniel Webb, appearing before the House Foreign Affairs Committee to appeal for prompt approval of President Truman's Point Four world aid program, stands next to an economic chart used in the testimony. Left to right are Willard Thorp, assistant secretary of state for economic affairs, Mr. Webb and Rep. John Kee, chairman of the committee

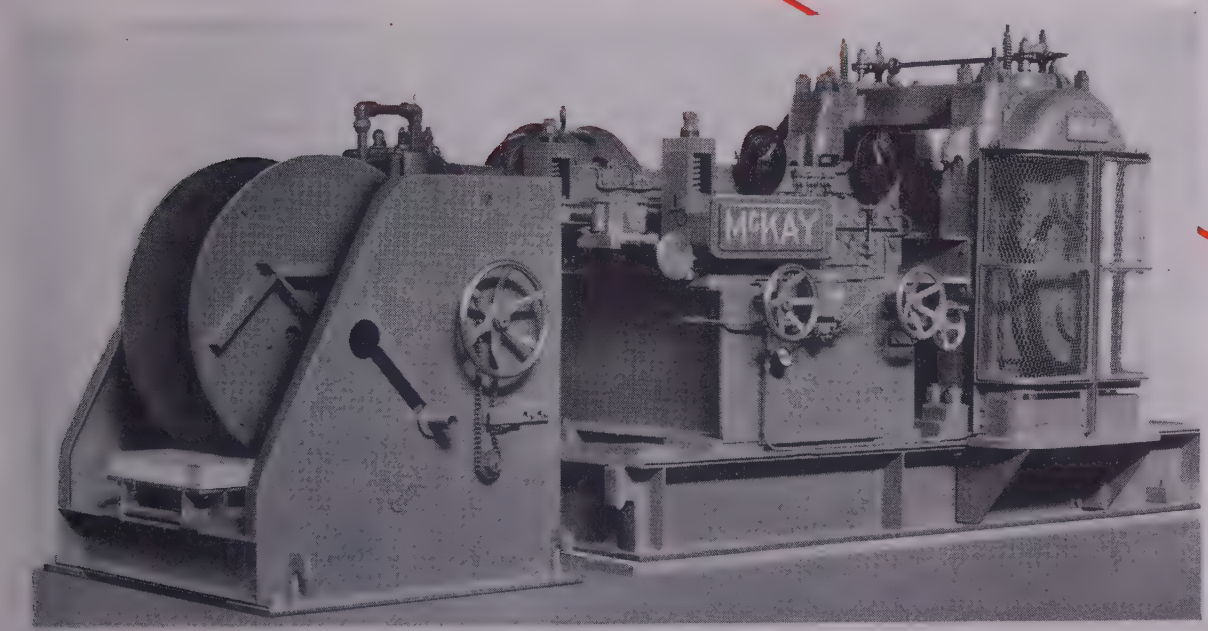
McKAY

Will cut it **CLEANER** *and do it* **FASTER**



PLAN VIEW OF EQUIPMENT

- A Roller Leveler and Rotary Drum Type Shear, (Utilizing Geneva Motion) are combined to produce cut to length strip from the coil.
- Extreme accuracy is developed through use of fluid drives and differential hydraulic speed control.
- Delivery speed 100 to 300 feet per minute.
- Lengths are variable from 2 to 20 feet.
- Compact design minimizes floor space.
- Rugged construction insures continuous performance.
- Leveler capacity 16 gauge to 1/4" thickness — SAE 1020 steel.
- Shear capacity 1/8" x 24" or 1/4" x 12" — SAE 1020 steel.
- Engineered for low cost high speed production.



The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

labor practice provisions of the National Labor Relations Act, and give to anyone who is refused employment or dismissed from a job the right to bring action against the employer, alleging some motive of discrimination because the applicant or employee is white, black, Protestant, Catholic, Jewish, Czech, Pole or German.

"Such motives," Senator Taft asserts, "are always possible to allege, and the question is left for decision to a board which is bound by no rules of evidence, and practically not subject to court review. The bill even includes national origin, so that in a city like Cleveland, employers could be sued by representatives of every nationality group, particularly if they do not have members of that nationality employed in the particular office or plant."

Under the Taft bill, the proposed FEPC would make comprehensive studies of alleged discriminations; it would publish reports and other information about discriminations and means to eliminate them, and would submit recommendations to employers, labor unions and other interested parties.

Get RFC Loans

LOANS by the Reconstruction Finance Corp. during August featured these substantial transactions of interest to metalworking companies:

The Warren Co. Inc., Atlanta, manufacturer of mechanical refrigerated display and storage equipment, for working capital and debt payment, $850,000 for five years;

Petco Corp., West Allis, Wis., oil production, refining and transportation equipment, for construction and machinery and other equipment, $2.5 million for ten years;

Lustron Corp., Columbus, O., manufacturer of prefabricated houses, for working capital, $2 million for 60 days (raising this company's indebtedness to the RFC to $37.5 million);

R. C. Allen Business Machines Inc., Grand Rapids, Mich., manufacturer of office machinery, for construction, machinery and equipment, $900,000 for five years;

Redmond Co. Inc., Jacksonville, Ark., manufacturer of fractional horsepower motors, for working capital and debt payment, $650,000 for five years;

Northwest Air Lines Inc., St. Paul, for purchase of airplanes, $21 million on participation basis, with $12 million from RFC and $9 million from private banks;

Mifflinburg Body Works Inc., and American Bowling and Billiard Corp., Mifflinburg, Pa., manufacturer of radio and television cabinets, trailers, bowling alleys, etc., for machinery and equipment, $550,000 for seven years.

Looks to U. S. for More Funds

UNDER consideration by the Export-Import Bank of Washington is a loan application from the Companhia Siderurgica Nacional (National Steel Co.) of Brazil for $16 million to be spent in the United States for additional steel plant equipment.

The bank previously loaned to this interest $45 million, all spent in the United States for equipment.

Total investment in the plant at Volta Redonda, Brazil, 90 miles from Rio de Janeiro, is equivalent to $175 million, of which $45 million has been advanced by the Export-Import Bank and $130 million by Brazilian private investors and Brazilian government.

Construction Costs Stabilize

NEXT few months will provide the first real period of relatively stable prices in the construction industry since the war's end, says C. B. Wigton, president of Wigton-Abbott Corp., Plainfield, N. J. The steady downtrend in construction costs has run its course and the balance of inflationary and deflationary forces is even and likely to remain so, he believes.

He continues, "There are indications that by next spring any number of new factors may be operating which would tend to upset the balance and exert further upward pressure on building prices." Any further fall in construction prices at the present time will reflect seasonal factors, he says.

Building material dealers with substantial inventories are willing to undersell to maintain steady sales volume and keep key men employed during the off season.

Campaign Backfires?

THE WANING campaign to eliminate "five percenters" and "influence peddlers" may have an effect of the reverse of that intended. Several cases have come to light where companies that were without Washington connections have made such arrangements, retaining men on a straight salary basis as a rule, to act as their agents with government procurement agencies.

"New business has not been coming in as rapidly as before," the sales manager of one of these companies told STEEL, "and we have engaged the services of a man to keep us advised of government procurement opportunities. He does not claim to be an influence peddler, but he seems to be well and favorably known to many procurement officers, and he knows how to do business with the government. We think he will save us a lot of time and motion that we would lose because of our unfamiliarity with government procurement. We are prepared to make it worth his while to get business for us."

Can't Help Small Business

MILITARY procurement officers may go to Congress soon to report they are unable to comply with the recently adopted requirement that small business receive a fair share of government orders.

Several efforts to place business with small companies following competitive bidding have come to naught because legally business must be placed with the lowest bidder. If the procurement departments are to place orders for standardized commercial products with small business, they will need more latitude than given them under existing laws.

To Report on Safety

PROGRESS REPORT meeting of the President's Conference on Industrial Safety is to be held in Washington June 5, 6 and 7, 1950, Labor Secretary Maurice J. Tobin announces. It will hear reports of state progress in industrial accident prevention and consider amendments to technical committee reports drafted at the initial conference last March.

Navy Bureau Has New Chief

NEW CHIEF of the Navy's Bureau of Supplies and Accounts is Rear Adm. Charles W. Fox. He assumed his new duties Oct. 4, relieving Rear Adm. Edwin D. Foster who will become chief of naval materiel with the rank of vice admiral. Rear Admiral Fox is that rarity, an admiral who started as an enlisted man. He went with the Navy in 1913 and has served with distinction in supply posts ever since.

Sub-Zero Tool Steel Research

AS PART of its responsibility to develop general purpose hand tools, the Military Planning Division of the Office of The Quartermaster General is conducting research on tool steels for use in low temperature areas. Hand tools like hammers, axes, hatchets, chisels, pick axes—made of ordinary tool steels—have a tendency to become brittle and often fail under use at sub-zero temperatures.

Europe Still Tinkers with Its Money

Aftermaths of devaluation hit Britain, France. West German mark pared from 30 cents to 23.8 cents. Currency revaluations tend to balance out

VESTERN Europe's financial mehanics are still trying to line up he wheels of their monetary vehicles.

The British government's move to urb business profits still more—a op to labor's protests at devaluation —has aroused industry which now nust pay out more than half its earnngs to government. Despite this acion, labor's full support for the govrnment is not yet assured.

The French cabinet barely averted ollapse over wage-price relations, a roblem made more acute by devalation. France will ask for a Westrn European conference to prop montary and economic stability.

A three-way tussle among West erman, French and British officials eveloped over devaluation of the Vest German mark, but a compronise pegs it at 23.8 cents from the ormer 30. France and Britain anted it higher, the Germans lower.

As it is, many wonder if interuropean trade will be improved one ota as a result of devaluation. The olume of commerce remains about he same as it was before currency djustments. Action by one country o get cheaper money balances out similar step by someone else.

J. K. Profit Tax Labor Sop

"You're robbing Peter to pay Paul" as British industry's cry when the overnment raised the 25 per cent tax n distributed dividends to 30 per ent in an effort to stall labor. U. K. usiness is now the most heavily axed in the free world.

Businessmen say taxes already are discouragement to enterprise. What ompanies need is an incentive to enture into the dollar market, not deterrent.

Installations of two British oil reneries will be expanded under inustrial recovery projects approved y ECA. The projects are the Shell aven refinery of Shell Refining & Iarketing Co. Ltd. and the Llandarcy efinery of National Oil Refineries td., a subsidiary of Anglo-Iranian il Co. Total cost is estimated at 106.4 million, including $17,293,000 ECA assistance funds.

The Shell project will provide for n increase in capacity of about 3 illion net tons yearly. Shell Haven efinery's present capacity of 440,000 ons consists mainly of lubricating ils, waxes and asphalts. ECA funds totaling $10,043,000 for this program will be used for engineering fees and for purchase of special materials and equipment in the U.S. This equipment includes pumps, valves and fittings, instruments, piping, large derricks and cranes.

The other British project calls for $7,250,000 in ECA funds to cover the cost of engineering fees and the purchase of special materials and equipment in the U.S. Construction will boost the Llandarcy refinery's capacity from about 375,000 tons per year to 2,180,000 tons annually.

French Cabinet on Thin Ice

France's cabinet headed by Henri Queuille is still on thin ice in the wage-price stability question. In addition to proposing a European parley to prop the economy, the cabinet at least postponed its collapse by agreeing to submit a bill for a return to collective bargaining to Parliament by the end of October instead of waiting until January as has been proposed.

Now most industrial wages are controlled by the French government. A return to collective bargaining would mean a partial return to natural wage levels.

On Oct. 1 the government eased its import restrictions on a few categories of steel products; further releases are possible if reciprocal action is taken by other nations. This could be the small beginning of greater inter-European trade. French exports of iron and steel products have improved since the first of this year. For the first seven months of 1949, 831,000 net tons were shipped overseas, compared with 398,000 tons in the corresponding 1948 period. Bulk of exports consisted of merchant bars, pig iron and semifinished products.

France has delivered a rolling mill for light structurals to Israel; its capacity is about 45,000 tons annually. Part of the auxiliary equipment for the plant has been ordered from the U.S. Operations should begin in about a year.

ECA has also approved installations of three French oil refineries, to cost $44,065,000 including $4,127,500 in ECA assistance funds to be spent in the U.S. for engineering fees and equipment.

The recipient French refineries are the Berre unit of Compagnie de Raffinage Shell, the Notre Dame de Gravenchon refinery of Socony-Vacuum Francaise and the Port Jerome refinery of Standard Francaise des Petroles.

About $57 million has been released from the French counterpart fund to finance investment program for October. Funds released will be used for coal mines, electric power plants, war damage reconstruction, private

ON EXHIBIT: All sections of the British engineering industry except motor cars and aircraft were represented at the Engineering and Marine Exhibition held at Olympia, London, last month. Theme of the exhibition was "Production Efficiency is the Road to National Recovery"

industry rehabilitation and development of overseas territories.

German Mark Cut One-Fifth

The 20.1 per cent cut in the value of Western Germany's mark is considered moderate. The reduction would have been deeper, but France and Britain vetoed such action because they feared it would have given the Ruhr too strong an export advantage. As it is, Germany's leading exporters think they now will be on a competitive par with other nations.

The West German economic council is considering reviving the shipbuilding industry. About 100,000 tons of shipping could be built in the first year, providing employment for 30,000.

In order to provide Americans with up-to-date information on trade regulations in effect in Germany, a revised edition of the publication, "Trading with Germany," has been issued by Office of International Trade, U.S. Department of Commerce. Copies are available from Washington or from any of the department's field offices.

Teamwork Boosts Output, Payroll

STORY of three-way teamwork of management, employees and labor leaders is told by Kaydon Engineering Corp.

Close co-operation between labor and management has resulted in increased production and greater employment for the Muskegon, Mich., manufacturer of ball and roller bearings. It enabled the company to start a second addition to its plant since V-J day. When completed this fall it will add 20,000 sq ft of floor space at a cost of over $100,000.

A. H. Frauenthal, chairman of the board of directors, says a major factor in expansion—a 30 per cent boost in payroll and correspondingly high output—is increased productivity of workers. Increase in payroll is particularly interesting because Muskegon is in an area of acute labor distress currently.

Feine Expands Warehousing

EXPANSION of steel warehousing operations is planned by August Feine & Sons Co., Buffalo. Company plans to erect an additional 30,000 sq ft of space to its structural plant at Abby and Barage streets. It will provide more storage space for steel products to be sold in western New York. Secretary Earl A. Jung estimates the addition will cost close to $40,000. Principally a fabricator of ornamental and structural steel, Feine had conducted only a small warehouse business.

Turn on the Lights

You couldn't do it without metals' contribution to the parts of an electric lamp

"AND LET there be light." Metalworking industry has helped make this come true with its contribution to the parts of an electric lamp.

Brass, aluminum, iron, steel, copper, nickel, manganese, tungsten and molybdenum are used in the manufacture of incandescent and fluorescent lamps. Shipments in 1949 promise to approach those of the record 1948 when 1,912,000,000 lamps, valued at more than $208 million, were delivered.

GE Largest—General Electric Co., largest of the more than 30 manufacturers in the industry, consumes the greatest amount of metal in production of bases. Last year 9,350,000 pounds of brass were used, compared with 6.3 million pounds in 1939. In 1948 some 200,000 pounds of aluminum were consumed, against none in 1939.

About 509 tons of iron, steel, copper, nickel, brass and manganese were used last year on lead wires alone, compared with 193 tons in 1939.

GE consumed 70,000 pounds of tungsten wire, primarily for filaments, and 32,000 pounds of molybdenum wire, chiefly for supports and mandrels, in 1948, compared with 35,000 pounds of tungsten and 19,000 pounds of molybdenum in 1939.

A GE 40-watt fluorescent lamp contains 20 per cent greater combined weight of metallic parts than an incandescent lamp of comparable light output.

Conventional Machinery—The manufacture of the great majority of all lamp bases involves the use of conventional eyelet machines and dieing machine to produce shells and eyelets which subsequently are bonded together with a glass insulation to form the finished parts.

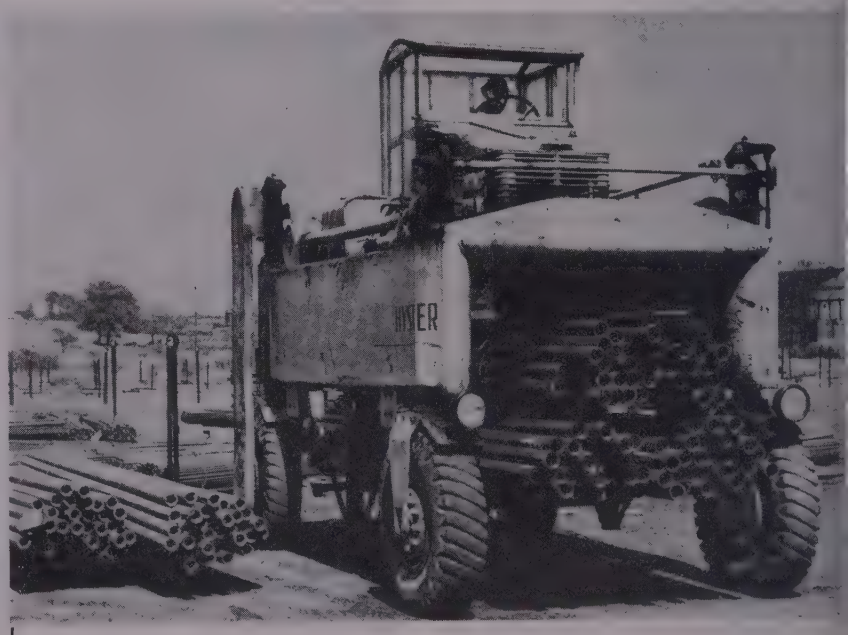
GE designs and builds most of the equipment for fabricating its various lamp parts. In some instances, notably in base making, GE uses standard machines and adapts them with specialized tooling of its own design.

Workshop Hobbyists Tighten Up

BASEMENT workshop enthusiasts are tightening up in their purchases of hobby tools.

Some producers complain of "considerable additional competition in an already crowded field." South Bend Lathe Works, South Bend, Ind., estimates that demand today is off 25 or 30 per cent compared with this same time last year and it is probably down 60 to 80 per cent from what it was in 1941. The present lower sales level is expected to continue for the rest of 1949 and throughout 1950.

Simpler, less expensive models are selling the best. The market has



STRADDLE HOIST: This Hyster straddle truck handling steel pipe carries its load between its wheels. The versatile truck is capable of 55 mph backward and forward; some models have four or five speeds that can be used in either direction

settled down to the serious experimenter. The beginning hobbyist attracted by fancy, complex equipment is rarer.

Prices are only moderately above prewar quotations. South Bend, for example, reports its average price level only 15 to 16 per cent above what it was in January, 1941. Isolated items are actually selling for less than they were before the war because of manufacturing efficiencies.

Big Business Bolsterer

Size of U. S. industry made possible partly because of greater ingenuity of business machines

U. S. INDUSTRY can be big and complex partly because of the growing efficiency of office equipment.

Thirty times as many office workers are employed now as in 1873 when the first business machine, the typewriter, was introduced. In 80 years total manufacturing employment for all industries in this country has risen to a point only seven times that of the 2.1 million in 1869. Today, the office equipment manufacturers make not only typewriters but adding machines, sorting machines, cash registers and many variants on these four basic types. Giants like Remington Rand Inc. and International Business Machines Corp. have incomes exceeding $160 million annually.

Trend Shifting—For many years the natural growth of American industry accounted for most of the growth among office equipment makers. Today the office equipment industry is growing horizontally more than vertically. It is finding the greatest opportunity for more sales volume among the companies which already use the basic machines but need more ingenious devices to make manageable their necessarily complex office procedures. Now the industry is supplementing its old sales theme of office economy and efficiency with office simplification.

More Research—To meet this shift, office equipment manufacturers are increasing their research and development programs to design new machines for new needs. IBM last year spent a record $3,257,618 for engineering and development; this figure will be even higher for 1949. Remington Rand, Burroughs Adding Machine Co. and all the other manufacturers are doing the same thing.

Burroughs is giving financial support to scientific studies at the universities of Michigan and Pennsylvania. The company has established a Philadelphia laboratory for study of electronics and electromechanical operations. Expansion of research facilities has just been accomplished or is planned by the entire industry.

New Products—Typical of the new products introduced in the past few months are six electric accounting machines by IBM, a microfilm records system by Burroughs, an industrial television system by Remington Rand. Trend in equipment is toward higher speed, greater automaticity and flexibility.

Production is leveling off. It is lower than at this same time last year, but still two to three times what it was in 1939. Prices have risen on office equipment products, but not to the extent of the general price rise since 1939. IBM's prices, for example, are only 6 per cent above 1939, against the national average of 94 per cent. This situation is partly because the industry controls to an unusual degree the cost and price of its components. Most business machines manufacturers make at least 95 per cent of all their parts.

Goodyear Builds Cabinets

ASSEMBLY lines at Goodyear Aircraft Corp.'s plant in Akron are being used to build a wide variety of kitchen cabinets for Montgomery Ward & Co., Chicago. Both floor and wall type cabinets are being produced utilizing a conveyor system nearly 200 feet long.

About 300 of Goodyear Aircraft's personnel will devote part or full time to production of the cabinets which were designed by Ward and developed by the aircraft firm's engineers.

Complete forming, spotwelding, finishing, final assembly and packaging will be handled at Akron. Parts production is in Plant A, the world's largest airship dock, and assembly is in adjoining Plant B. Six automatic machines are being used for spotwelding. Enameled parts will be baked in an overhead fully suspended oven, 108 feet long and 24 feet wide.

Bridges Influenced by Airplanes

"BRIDGES don't fly, but bridge builders can take note from the boards of airplane designers" was the comment made by a jury of award member of the James F. Lincoln Arc Welding Foundation, Cleveland, in announcing results of the foundation's award program.

Future bridge designs, submitted from 25 different states, were clearly influenced by the type of structural engineering that created the modern airplane. Welding of rigid airplane frames suggested a typical bridge of the future.

CALENDAR OF MEETINGS

Oct. 10-11, Boston Conference on Distribution: 21st annual affair, sponsored by Boston Chamber of Commerce, Harvard University, Boston University and others.

Oct. 10-13, Purchasing Agents Association of Baltimore: Annual manufacturers' products exhibits, Lord Baltimore Hotel, Baltimore. Chairman of the management committee is Stephen J. Buschman, Stark Electric Co., 1300 S. Short St., Baltimore.

Oct. 10-13, National Wholesale Hardware Association and National Association of Sheet Metal Distributors: Annual convention and meeting, Marlborough-Blenheim Hotel, Atlantic City, N. J.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmont Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

Oct. 11-14, American Standards Association: 31st annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 70 E. 45th St., New York.

Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary, 235 W. 102nd St., New York.

Oct. 13, American Iron & Steel Institute: Regional technical meeting, Hotel Pick-Ohio, Youngstown.

Oct. 13-14, Steel Founders' Society of America: Fall meeting, Ambassador Hotel, Los Angeles. Society headquarters are in the Midland Bldg., Cleveland.

Oct. 13-14, Society for the Advancement of Management, Chicago Chapter: Fall training conference, at Illinois Institute of Technology. Conference chairman is H. A. Mercer, Sterling Tool Products Co., 2085 N. Hawthorne Ave., Melrose Park, Ill. Fee is $15 for society members and $30 for nonmembers.

Oct. 13-15, Industrial Management Conference of the University of Missouri: Third annual meeting, University of Missouri, Columbia, Mo.

Oct. 13-15, Foundry Equipment Manufacturers Association: Annual meeting Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters are in the Engineers Bldg., Cleveland.

Oct. 14-15, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Southern Ohio Section of Open Hearth Committee, Deshler-Wallick Hotel, Columbus, O. Institute headquarters are at 29 W. 39th St., New York.

Oct. 14-16, Metal Treating Institute: Annual meeting, Cleveland. Institute headquarters are at 420 Lexington Ave., New York.

Oct. 16-18, Conveyor Equipment Manufacturers Association: Annual meeting; write to G. D. O'Brien, assistant manager, Greenbrier Hotel, White Sulphur Springs, W. Va.

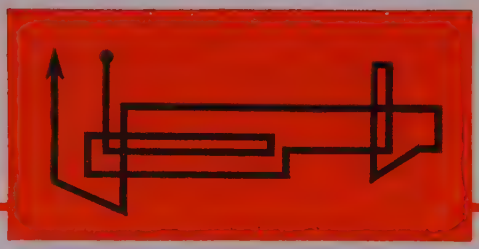
Oct. 17-20, Wire Association: Annual convention, LaSalle Hotel, Chicago. Association headquarters are at 300 Main St., Stamford, Conn.

Oct. 17-21, 31st Annual National Metal Congress and Exposition: Sponsoring societies are: **American Society for Metals, American Welding Society, Metals Branch of the American Institute of Mining and Metallurgical Engineers and Society for Nondestructive Testing.** Public Auditorium, Cleveland. Secretary of American Society for Metals is W. H. Eisenman whose headquarters are at 7301 Euclid Ave., Cleveland 3.

Oct. 23-26, National Institute of Governmental Purchasing: Meeting, Hotel Cleveland, Cleveland.

Oct. 24-25, National Association of Suggestion Systems: National fall conference, Hotel Statler, Cleveland. Headquarters are at 122 S. Michigan Ave., Chicago 3.

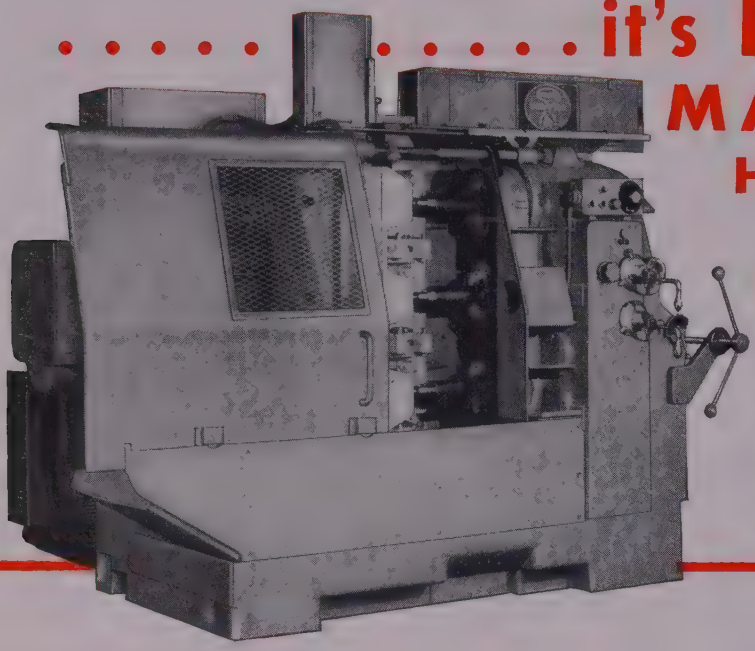
Oct. 24-28, National Safety Council: National safety congress and exposition, Stevens, Congress and Morrison hotels, Chicago. Council headquarters are at 20 N. Wacker Dr., Chicago.

Follow this  Tool Path

. . . . . it's BULLARD

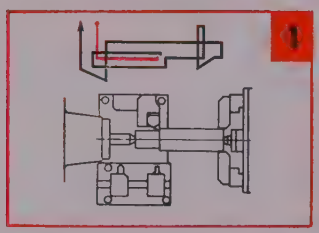
MAN-AU-TROL

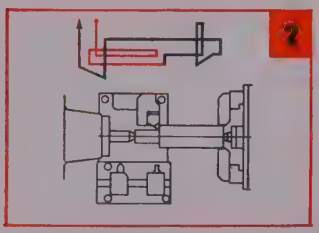
HORIZONTAL LATHE MODEL 30H

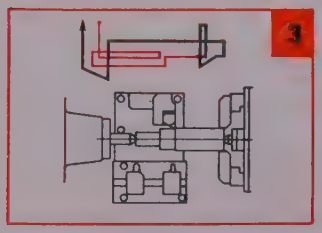


For Between Center Work On Shafts And Chucking Jobs Requiring — *Turning* — *Grooving* — *Facing* — *and Angular Turning.*

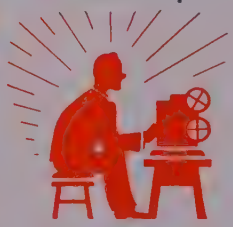
Fully automatic for Production runs or operated manually for short runs without disturbing the automatic setup.





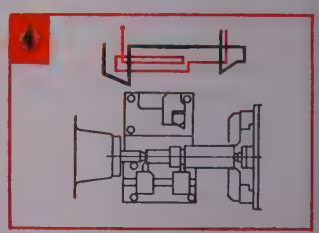


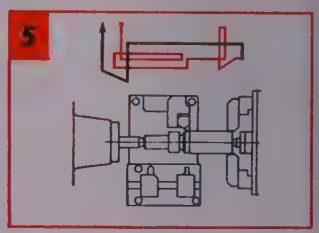
Man-Au-Trol has no predetermined sequence of operating functions, except when set for a given job. No cams are used for the movement of saddle or tool slide or for dwell at the end of a cut. Repetitive accuracy and uniformity of finished work is assured. 1. Drive pinion Shaft SAE 3250 Bar Stock steel (size 3" x 11¾") 1st. Oper. rough turn. 2. 2nd Oper. Finish turn to size. 3. 3rd Oper. finish turn to size. 4. 4th Oper. Lower tools groove and chamfer end. 5. 5th Oper. Upper tool enters groove generates 30 degree angle and finish turns to shoulder. 6. 6th Oper. finish face end of shaft. Production per hour 52 pieces.

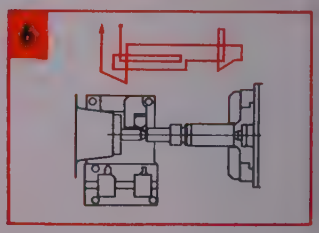


16MM SOUND MOTION PICTURE

Showing the setup and operation of the Bullard 30H Lathe is available for group showing. — When writing advise your preferred date.







THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Air of futility settles over auto industry as steel plants close. Inventories are comfortable in major plants, although suppliers' stocks are unbalanced

DETROIT

AN AIR of futility settled over the motor industry as steel mills followed coal mines into idleness. Stocks of flat-rolled and bar steel are comfortable among the automotive producers but they, of course, are at the mercy of thousands of parts suppliers, some of which will exhaust steel inventories in a matter of weeks and some of which are already closing because they have labor contracts with the United Steelworkers-CIO. Early last week, purchasing departments were making renewed checks among suppliers to determine the outlook. Some reported they could outlast the auto plants, but were inclined to a gloomy view of the overall situation since as long as "John L. has his boys out of the pits" there was little reason to expect any early action in the steel mill tieup.

Many Over 60—Settlement of the Ford pension dispute, which had been dragging on for 108 days, came to a dramatic conclusion after 35 hours of continuous bargaining. There had been a feeling that Ford's decision on pensions might forestall the steel strike.

However, as E. R. Breech, Ford executive vice president, warned in an address at Youngstown, Sept. 27, the acceptance of Ford's ideas by another company—either inside or outside the automotive industry—would be a serious error. The situation at Dearborn is peculiar to that company in that, for one thing, an estimated 13,000 of 115,000 employees in plants throughout the country are over 60 years of age.

Ford Pays 8¾ Cents—Ford decided it would invest in a pension plan up to a maximum number of cents per hour—8¾c as it finally developed—and then obtain from this investment the best benefits which could be expected from a financially and actuarily sound plan. It was determined the pension plan would be contributory if employees wanted more benefits than could be obtained under this arrangement, and noncontributory otherwise.

Mr. Breech called attention particularly to the steel board's recommendation for a return to collective bargaining in order to provide an opportunity to each company to prove that the considerations, conclusions and recommendations of the report are not in fact applicable to it. He entered strenuous objection to collective bargaining on a "pattern" basis as a straitjacket on competitive enterprise and its employees.

Starts in March—The Ford pension plan will not start until next March and will not be subject to further negotiation for five years. This reflects the earnest effort on the part of motor companies to set up contracts on a longer basis, and avoid the heated negotiating sessions which have disturbed the picture for the last four years.

The complete Ford contract runs for 2½ years and may not be opened for any discussion inside of 15 months. While in one sense this amounts to protection for the company, in another way it figures to a considerable gamble, since no one can forecast the business trend accurately for this length of time and Ford in effect has bet it can continue to pay the going high wage rate even in the possible event of a serious decline in business.

Company Picks Trustee—In connection with pensions, Ford reserves the sole right to select a qualified bank or trust company to administer the fund and also to determine the period for setting up a fund for past services. This would include the years a man has been employed but for which the company has made no pension deposit. It is estimated on the basis of the number presently employed the company will need to make an initial investment of $200 million for the pension fund.

An interesting subject for speculation is just where this large sum will be put to work. In the past, pension funds largely have been sunk into national, state or municipal bonds, where the return is low. It is conceivable the administrators of the Ford fund may choose high-grade common or preferred stocks which, especially right now, have often a spectacularly high dividend payoff.

Start Drive on Chrysler—Immediately upon conclusion of the Ford negotiations, the UAW-CIO announced it would move ahead on Chrysler Corp. for similar pension awards. Thus far, Chrysler has indicated it does not consider pensions bargainable under terms of its contract which specifically bars discussion of any subject except wages this year. However, in a recently conducted state strike vote in Chrysler plants, the balloting went 8 to 1 in favor of a strike if necessary.

Independents Face Demands—General Motors appears fairly well protected in the pension push, although it is known to have been giving the subject intensive study. Position of the independent manufacturers has been made more precarious, since they are less able financially to weather the admittedly high costs of pensions. Still, there seems little doubt that all of them will be faced with union demands for the equivalent of the Ford plan. Paradoxically, it appears, the government in its support of industry-financed old-age pensions has merely tended to make big business bigger, all the while it has been giving lip-service to the presumed plight of small business.

It is felt in many quarters of the motor industry that the eventual upshot of the current swing to pension plans will be for the government to boost its take and payoff under federal old-age security to relieve unfair financial pressure on one company and not on another. In such an event the Ford outlay, for example, would be reduced, inasmuch as the company has agreed only to pay pensions of $100 monthly, inclusive of federal payments, and to workers with 30 years of service at age 65, retirement being mandatory at age 68.

Asks $30 Million Loan

AS MANY observers expected, Kaiser-Frazer has asked the RFC for a loan of $30 million to retool its plant and expand working capital. The word came out of Washington and was met with silence by company officials, although it was understood a press conference was being planned shortly to explain the entire corporation picture.

Washington advices indicated the company was considering two new cars—one a $2000 completely redesigned model and the other a lower-priced job to compete directly with Ford, Chevrolet and Plymouth.

Request for the financial assistance

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was presented to the RFC about three weeks ago, and an early answer was being anticipated last week, all conditions of the loan not having been established. Among other problems to be worked out is the matter of what government agency will have priority on loan repayments, the company now operating the Willow Run plant under purchase agreement from the War Assets Administration. Furthermore, the Bank of America and Mellon National Bank have first rights to all equipment assets under terms of a $25 million line of credit set up in January of this year.

Plant for DeSoto Production

SOME YEARS AGO Chrysler Corp. purchased a large plant building on West Warren avenue in Detroit, at one time occupied by Graham-Paige and, during the war, by the military services. Until recently it has served as a storage depot for Chrysler. It it now being equipped for production of DeSoto bodies and for certain machining operations. DeSoto bodies which originate in Chrysler plants on Detroit's east side must be trucked across town to the DeSoto final assembly plant. The Warren avenue operation will relieve this hauling problem and also free additional facilities at the east side plants.

Packard Curtails

PACKARD was the first builder to revise planning in the face of steel mill closings. It scheduled suspension of operations for two days last Thursday and Friday, involving the layoff of close to 7850 of 12,413 employees. The shutdown was ascribed to stock shortages "already caused by the steel strike," a necessary prelude to balancing out operations on a reduced tempo. Work will be resumed Monday "on the best basis that will equalize the flow of cars to the field, give proper service to customers and employ the most people the longest time." It was estimated production could be continued into next month, employing 8000, before material stocks were depleted to the point where complete stoppage would be required.

Of course, the interruption to steel supplies might be considered as a logical excuse for tapering assemblies, even if the real reason were declining sales. However, there is no reason to suppose this is the case with Packard which in the week of Sept. 19-23 registered the highest total of car output in its history. Average daily production last month was approximately 700, ahead of the August level. If field stocks have been growing out of proportion to sales, then perhaps it has been a fortunate circumstance, in view of the easing off which now has been dictated.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	675,000*	478,186
September	647,000*	437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Sept. 17	159,493	94,410
Sept. 24	158,007	98,394
Oct. 3	151,037	121,475
Oct. 10	145,000	119,398

Estimates by Ward's Automotive Reports

Hudson Readying Small Model?

HUDSON temporarily laid off about half its working force for a week, resumption being scheduled this week. Inventory adjustment and repairs to heavy equipment are given as the reason for the slowing, although trade sources believe a start is about to be made on a smaller model. October assemblies of the new job doubtless will be at a leisurely rate.

Strike Idles 15,000

THE steel mill walkout idled an estimated 15,000 in the Detroit area at four plants, the largest of course being Great Lakes Steel Corp., unit of National Steel. This company lost no time in making its position clear in the newspapers, pointing out it had offered 4 cents an hour toward group insurance and 6 cents toward pensions, the latter to be the subject of collective bargaining study between now and next spring, with the object of working out a substantial and secure plan and of determining any amounts which might be required from employees. Great Lakes began an insurance plan in 1923 and started pensions in 1941.

The new offer, which the USA is said to have refused to discuss at all, would have provided the following: $3000 life insurance, $1000 paid-up life insurance upon retirement at 65 with 25 years of service, $31.50 accident and sickness benefits for as many as 26 weeks, $8 per day hospital benefits for the employee and all members of his family for 31 days, along with $100 for hospital "extras", and a $200 standard schedule of surgical benefits.

Ormond E. Hunt Retires

ENGINEERING veteran of the automotive industry, Ormond E. Hunt, retired Oct. 1 at the conclusion of a notable 40-year career. Graduate of the University of Michigan, he was superintendent of construction for John Russell Pope, New York architect, and the George A. Fuller Co. at Washington from 1907 to 1909, and began his automotive experience with Packard as draftsman. After a short period at this job he became chief draftsman of the Truck Division, body engineer, assistant to the vice president and assistant chief engineer. Later he became chief engineer in charge of Liberty aircraft engine design and production in World War I. After the war, he served a couple of years more with Packard, then joined Chevrolet as chief engineer in 1921. Here he teamed with sales manager Richard H. Grant and the late W. S. Knudsen, and by 1927 these three, with their staff engineers and production experts, had moved Chevrolet into position as the largest auto manufacturer in the United States.

In 1929, Hunt was named GM's first vice president in charge of engineering and under his direction were placed such activities as the Proving Ground, the new devices and patent sections, as well as product study groups.

Hunt actually founded the latter groups which pioneered in the development of independent suspension and automatic transmissions for GM cars and busses. He was named to the board of directors in 1934 and served as a member of the operations policy and administration committees, in 1942 becoming an executive vice president. During World War II he was assigned the complexities of war contracts and worked with Vice President R. K. Evans in the organization and development of wartime engineering of aircraft engines by the Allison Division. Over the past 28 years he has been a tower of strength in GM engineering, although through all of this time a completely modest and self-effacing personality.

ARISTOLOY STEELS

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With increased plant facilities, our new 9″-12″ mill addition, Copperweld maintains its position in quality alloy steels. Now we are able to supply electric furnace melted alloy steels in a more complete range of sizes, grades and finish.

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COPPERWELD STEEL COMPANY
WARREN, OHIO

1578 Union Commerce Building
Cleveland, Ohio

117 Liberty Street
New York, New York

7251 General Motors Building
Detroit, Michigan

403 W. Eighth Street
Los Angeles 14, California

3104 Smith Tower
Seattle, Washington

Monadnock Building
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Chicago, Illinois

529 Fisher Building
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New Industry Alignments

Five companies buy or arrange to buy facilities of five established firms

HERE are five new alignments in the metalworking industry.

Sheet Steel Galvanizing took over Chapman-Price Steel. American Machine & Foundry arranged to purchase assets of DeWalt. Lonergan Mfg. bought out Refrigeration Corp. of America. Mills Alloys sold out to Victor Equipment. And Ford bought Kelsey-Hayes Wheel Co.

Seeking to interest a large industrial firm in buying some of its large steam locomotive repair plants is Delaware, Lackawanna & Western Railroad.

Chapman-Price Steel Sold

Sheet Steel Galvanizing Corp., Indianapolis, a newly formed company, has taken over the mill formerly operated by Chapman-Price Steel Corp. in Indianapolis.

Plans are underway to put the entire facilities of 200 tons a day galvanizing capacity into immediate operation. Company officials expect to employ about 500 persons at maximum operation. The new corporation will specialize in contract sheet steel galvanizing and offer complete facilities in pickling, shearing and corrugating operations.

Plant will be under management of Henry Winski of Northern Indiana Steel Supply Co., Michigan City, Ind., and Robert Bregan of Price Iron & Steel Co., Chicago.

Refrigeration Firm Bought

Refrigeration Corp. of America, wholly owned subsidiary of Noma Electric Corp., New York, and producer of the "Frigid-Freeze" line of frozen food and ice cream cabinets, has been sold to Lonergan Mfg. Co., Albion, Mich.

Joint announcement by Henri Sadacca, Noma president, and Simon J. Lonergan, president of Lonergan, said the new owners will assume operation of Refrigeration Corp. Oct. 1 and will continue to service Frigid-Freeze customers after that date.

Mr. Sadacca explains the sale as part of Noma Electric's long-range plan for complete consolidation of its manufacturing facilities.

AMF Arranges to Buy DeWalt

American Machine & Foundry Co., New York, has reached an agreement to acquire all properties and assets of DeWalt Inc., Lancaster, Pa., subject to approval of DeWalt stockholders. Sale is slated for early December.

DeWalt plans to sell all assets for 115,000 shares of AMF common plus $665,313 in cash. If DeWalt sells its assets under this plan, it will dissolve. Date for a meeting of stockholders has not been set. Company manufactures radial saws for high speed cutting of light metals, wood and plastics.

The sales agreement was made as part of a diversification program of AMF, which manufactures a varied line of cigar, cigaret, bakery, stitching and industrial machinery.

Ford Buys Kelsey-Hayes

Ford Motor Co. purchased the Kelsey-Hayes Wheel Co. plant in Monroe, Mich.

Although the buying price was not disclosed, purchase included 570 acres of land fronting Lake Erie. D. S. Harder, vice president in charge of manufacturing for Ford, says final plans for operations of facilities have not yet been completed.

Victor Buys Mills Alloys

Victor Equipment Co., San Francisco, which purchased all assets of Mills Alloys Inc., Los Angeles, says the acquired firm will be designated the Hard-Surfacing Division Plant of Victor.

Products of Mills, a 25-year-old manufacturer of blasting nozzles and all types of tungsten carbide hard-surfacing rod, will be manufactured by Victor and will complement the parent company's line of gas welding and cutting torches and allied equipment.

The new items will replace similar products of other manufacturers now distributed by Victor in limited areas. Victor also gets all patents, trademarks, tradenames and formulas from Mills. Victor President L. W. Stettner says plans include addition of rod and mill equipment.

D L & W Wants to Sell

Delaware, Lackawanna & Western Railroad is seeking to interest steel automotive or other large industrial firms in taking over its large steam locomotive repair shops at Scranton, Pa.

These shops occupy about 15 acres. Lackawanna has facilities at its Keyser Valley shops near Scranton and other shops along its line to service the reduced number of steam locomotives. Lackawanna has made considerable progress is converting to diesel power.

Link-Belt Opens New Plant

LINK-BELT Co., manufacturer of chains, elevators, conveyors and power transmission machinery, formally opened its new manufacturing plant on a 10-acre plot in Houston.

The modern plant includes a one-story, all steel factory building with three bays and a two-story office section. Plant proper consists of a machine shop, structural steel shop and large warehousing facilities.

NATURAL LIGHT: Streaming through windows of new tool room headquarters at Harley-Davidson Motor Co., Milwaukee, is an abundance of daylight. The motorcycle manufacturing company's machines—all motor-driven—have been located for accessibility. In the foreground is a "scissors" type table; behind it, a hydraulic lift table

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Knapp Brothers Mfg. Co., Joliet, Ill., a 50-year-old manufacturer of metal baseboards, window trim and stools and other special metal building products, has been acquired by the owners of Steelcraft Mfg. Co., Rossmoyne, O. A new plant will be built on property adjoining the Steelcraft plant, and the business will be moved there; new company will operate under the Knapp name and will continue to market the standard line of products on a national basis.

—o—

Stevens Mfg. Co. Inc., Mansfield, O., and Hart Mfg. (Canada) Ltd., Aurora, Ont., signed a sales and manufacturing agreement: Effective immediately sales and manufacture in Canada of Stevens Type S bimetal thermostats will be handled by Hart; engineering and research facilities remain in Mansfield.

—o—

Whitehead Metal Products Co. Inc. moved its Newark warehouse to Harrison, N. J., where the new facility provides about three times as much floor space.

—o—

Parker Appliance Co., Cleveland, named Independent Rubber Co., Chicago, distributor of O-rings, manufactured by Parker. Independent Rubber will maintain stocks and supply engineering service on the application of the rings for all types of hydraulic and fluid-handling systems.

—o—

Paulsen-Webber Cordage Corp., New York, was appointed exclusive eastern sales representative for 93 products of Tubbs Cordage Co., San Francisco.

—o—

Simonds Abrasive Co., Philadelphia, opened branch offices and warehouse stocks of grinding wheels and abrasive grain at 8229 Hubbell Ave., Detroit, and 1350 Columbia Rd., Boston.

—o—

Kaiser Fleetwings Inc. is now Kaiser Metal Products Inc. Company completed a $2 million enameling plant at its factory in Bristol, Pa. Henry J. Kaiser, chairman of the board, said change of name marks an extensive conversion which takes the firm entirely out of the manufacture of aircraft components and into production of consumer goods and automobile parts.

—o—

Riverside Metal Co., Riverside, N. J., appointed International Brass & Copper Co. Inc., New York, as its exclusive agent for export business. International will handle Riverside's phosphor bronze, nickel sliver, cupronickel, beryllium-copper alloys, and products of Riverside's fabricating division, Keystone Watch Case Co.

—o—

Schatz Mfg. Co., Poughkeepsie, N. Y., manufactures a complete new line of precision clutch release ball bearings in a wide range of sizes for industrial and numerous automotive applications.

—o—

C. B. Herrick Co., Cleveland, has been formed by Clayton B. Herrick, until recently editor of *Industry & Welding Magazine.* Company will specialize in handling of fabricating and auxiliary welding equipment.

—o—

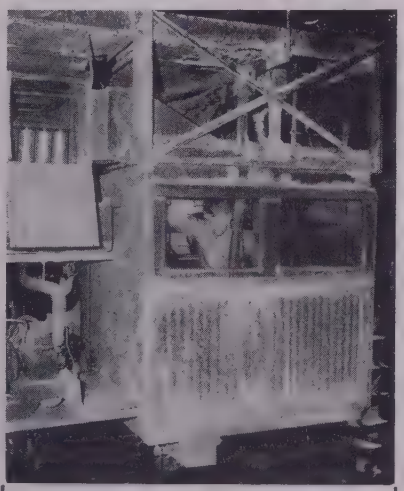
Copper Alloy Foundry Co., Hillside, N. J., appointed Wm. G. Boales & Associates, Detroit, as Michigan representative.

—o—

Botsford Metal Fabricating Corp. was incorporated in Buffalo with capital of $25,000. Incorporators are Gilbert J. Yager, Reed A. Chambers and Charles F. Boine.

—o—

Frederic Flader Inc., North Tonawanda, N. Y., will operate government-owned laboratory facilities at Toledo, O., under an arrangement completed with the U. S. Air Force. Facilities were formerly operated by Packard Motor Car Co. under an Air Force contract.



CLEAR AIR: A volume of vapors necessarily seeps into the air in this U.S. Metals Refining Co. smelter at Carteret, N. J., but activated carbon air purification equipment, product of W. B. Connor Engineering Corp., New York, gives the operator in the cab an almost ideal atmosphere in which to work

—o—

Permanente Products Co. established a new sales office for Kaiser Aluminum in Rochester, N. Y. George Kurachek is sales representative in charge of this, the 23rd Kaiser Aluminum field office.

—o—

J. W. Dice Co., formerly at Grand View-on-Hudson, N. Y., is now at 1 Engle St., Englewood, N. J., with expanded facilities for solving materials testing problems.

—o—

Marshall Steel Co., producer of high carbon tool steel, is located in its new factory in McCook, Ill., eight miles closer to Chicago.

—o—

American Pullmax Co. Inc. is a new company which will handle sales and service of the new Pullmax sheet steel and plate cutting machine. Offices and display rooms are at 2627 North Western Ave., Chicago.

—o—

Allied Research Products Inc., Baltimore, announces an all-pupose Iridite for the metal finishing market. It is Iridite No. 8—Huebrite, the manufacturer's latest answer to corrosion or painting problems in finishing zinc, cadmium, copper, brass, bronze and aluminum.

—o—

Students of the **Midwestern Technical Institute** gave a design exhibit at Park Ridge, Ill. Work was from the departments of Industrial Design and Architecture, directed by Hans Peter Nelson, designer.

—o—

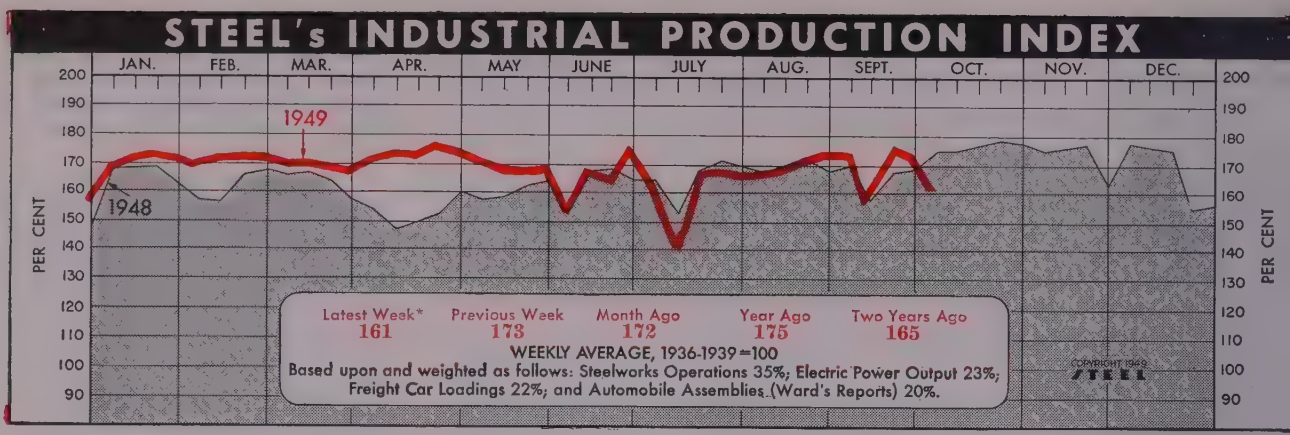
Burrell Technical Supply Co. is now Burrell Corp. The tester and instrument company is in Pittsburgh.

—o—

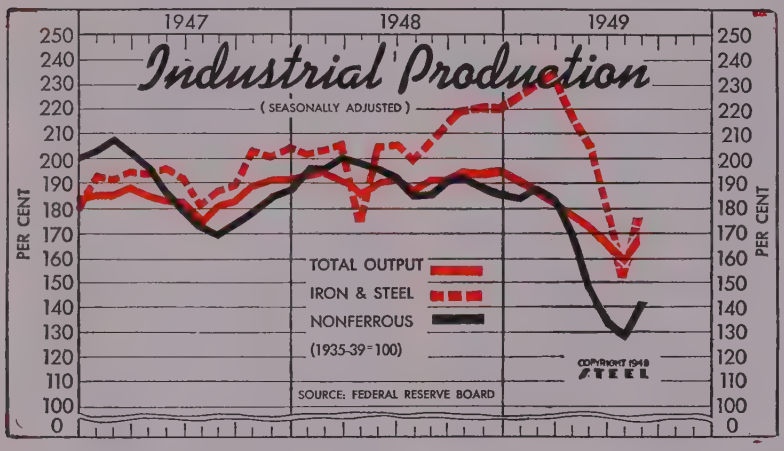
Gilles Machinery Co. has been formed by Edwin J. Gilles, associated with the machine tool industry for 26 years. Offices are at 413 Caxton Bldg., Cleveland. Company represents Hendey Machine Co., Gallmeyer & Livingstone Co. and Cleveland Planer Co. in the Cleveland area.

—o—

Allis-Chalmers Mfg. Co.'s Foremen's Club honored 42 men whose length of service numbers 50 or more years. The men were guests at a dinner in the Pfister Hotel, Milwaukee. The group included 13 men who are still working and 29 who retired. Twelve of the men began their first job for the firm more than 60 years ago. Three new 50-year men received service awards.

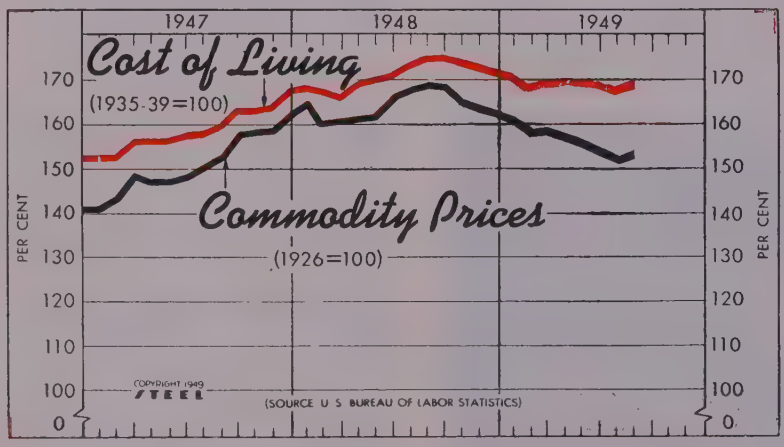


* Week ended Oct. 1 (preliminary).



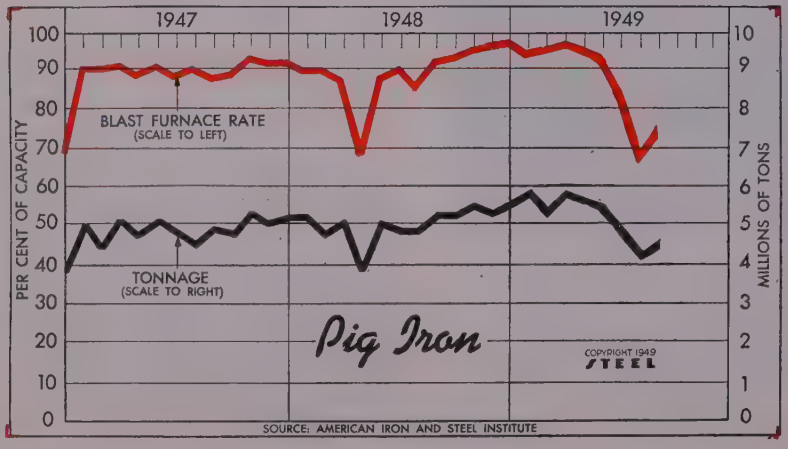
Federal Reserve Board's Production Indexes (1935-1939=100)

	Total Production		Iron, Steel		Nonferrous	
	1949	1948	1949	1948	1949	1948
Jan.	191	193	228	203	184	197
Feb.	189	194	232	203	186	197
Mar.	184	192	233	207	183	200
Apr.	179	188	219	177	168	198
May	174	191	204	206	145	196
June	169	192	177	208	132	194
July	162	186	156	201	128	185
Aug.	170	191	178	207	142	186
Sept.	...	191	...	214	...	191
Oct.	...	195	...	221	...	192
Nov.	...	195	...	223	...	187
Dec.	...	192	...	222	...	185
Ave.	...	192	...	208	...	193



Wholesale Commodity Price—Cost of Living Indexes

	—Commodities— (1926=100)			—Living Cost— (1935-39=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.5	165.7	141.5	170.9	168.8	153.3
Feb.	158.1	160.8	144.5	169.0	167.5	153.2
Mar.	158.4	161.4	149.5	169.5	166.9	156.3
Apr.	156.9	162.7	147.7	169.7	169.3	156.2
May	155.7	164.2	147.1	169.2	170.5	156.0
June	154.4	166.4	148.0	169.6	171.7	157.1
July	153.4	168.7	150.8	168.5	173.7	158.4
Aug.	153.0	169.5	153.7	168.8	174.5	160.3
Sept.	....	168.7	157.4	....	174.5	163.8
Oct.	....	165.2	158.5	....	173.6	163.8
Nov.	....	164.0	159.6	....	172.2	164.9
Dec.	....	162.3	163.2	....	171.4	167.0
Ave.	....	164.9	151.8	....	171.2	159.2



Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1949	1948	1947	1949	1948	1947
Jan.	5,725	5,194	5,071	95.5	90.9	90.8
Feb.	5,223	4,838	4,550	96.5	90.6	90.3
Mar.	5,820	5,020	5,123	97.1	87.8	91.8
Apr.	5,531	3,840	4,830	95.3	69.4	89.3
May	5,517	5,077	5,081	92.0	88.8	91.0
June	4,819	4,990	4,810	83.0	90.2	89.0
July	4,173	4,900	4,585	69.8	85.9	90.3
Aug.	4,477	5,255	4,916	74.7	92.0	88.1
Sept.	....	5,208	4,801	...	94.3	89.0
Oct.	....	5,520	5,228	...	96.6	93.6
Nov.	....	5,399	5,015	...	97.6	92.8
Dec.	....	5,595	5,177	...	98.1	92.9
Total	....	60,849	59,210	Ave. ...	90.2	90.1

* Includes ferromanganese and spiegeleisen.

The Business Trend

EARLY EFFECTS of the steel strike caused STEEL's industrial production index for the week ended Oct. 1 to drop sharply to a preliminary 161 per cent of the 1936—1939 average from 173 in the preceding week. The strike halted, for the present at least, the revival of industrial activity from the summer's slow pace. In the like week of 1948 the index was 175.

STEEL—The ingot rate skidded sharply to 70 per cent of capacity in the week ended Oct. 1 because of lost production and slowdown in operations preparatory to the shutdown. The following week operations were below 10 per cent of capacity. Only a few producers are unaffected by the strike.

AUTOMOBILES—Some easing is expected from the industry's hectic July through September pace, although passenger car and truck assemblies in the week ended Oct. 1 remained high at 151,037 units. Dealer stocks are building up as production outstrips sales and pared assembly schedules appear to be in the offing. Some production will be lost in the last quarter as builders make changeovers in readiness for increased 1950 competition.

PRODUCTION—Federal Reserve Board's seasonally adjusted industrial production index advanced to 170 per cent of the 1935—1939 average in August from 162 in July. August, 1948 index was 191. Iron and steel index was 178 in August, compared with 156 in July and 207 in August, 1948.

CARLOADINGS—Estimates by the 13 Shippers Advisory Boards to the Association of American Railroads are that freight carloadings in the last quarter of 1949 will be down 8.7 per cent from the same period in 1948. Loadings of the 32 principal commodity groups are expected to total 7,526,359 cars as compared with 8,242,113 in the last quarter of 1948. Shippers boards predict decreases in loadings ranging from less than 1 per cent on the Pacific Coast to 22.4 per cent in the Allegheny area.

COAL—Coal stockpiles decreased slightly in August and were 68.6 million tons on Sept. 1, down less than 1 per cent from the total a month earlier. Industrial stocks averaged 73 days on Sept. 1, compared with an 80-day average on Aug. 1. Days' stocks by industrial groups were: Electric power utilities, 117; coke ovens, 57; steel and rolling mills, 65; cement mills, 70; railroads, 49; other industrials, 66. In the first week of the United Mine Workers walkout bituminous coal output was 1,940,000 net tons, less than one-sixth of the 12.2 million tons produced in the like week of 1948.

CONSTRUCTION—Civil engineering construction volume was $163.9 million in the week ended Sept. 29. Heavy construction in the first nine months of 1949 is about $6.2 billion, 20 per cent higher than in the same period of 1948.

PRICES—Bureau of Labor Statistics wholesale price index declined 1.1 per cent in the week ended Sept. 27 to 152.4 per cent of the 1926 average. In the comparable week of 1948 the index was 167.8 or 9.2 per cent higher.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	70.0	86.0	86.0	96.0
	Electric Power Distributed (million kilowatt hours)	5,521	5,556	5,544	5,544
	Bituminous Coal Production (daily av.—1000 tons)	323	1,400	1,318	2,036
	Petroleum Production (daily av.—1000 bbl)	4,891	4,875	4,765	5,453
	Construction Volume (ENR—Unit $1,000,000)	$163.9	$188.7	$155.2	$128.1
	Automobile and Truck Output (Ward's—number units)	151,037	158,007	146,039	121,475
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	657†	661	704	909
	Business Failures (Dun & Bradstreet, number)	181	169	174	112
	Money in Circulation (in millions of dollars)‡	$27,348	$27,365	$27,389	$28,080
	Department Store Sales (changes from like wk. a yr. ago)‡	−8%	−7%	−1%	+1%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$13,076	$15,160	$11,322	$14,020
	Federal Gross Debt (billions)	$256.6	$256.4	$255.9	$252.3
	Bond Volume, NYSE (millions)	$13.6	$14.2	$10.0	$17.7
	Stocks Sales, NYSE (thousands of shares)	6,179	6,366	3,535	4,633
	Loans and Investments (billions)†	$66.5	$66.3	$65.1	$63.0
	United States Gov't. Obligations Held (millions)†	$37,874	$37,594	$37,114	$33,921
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	175.9	180.3	180.6	220.7
	All Commodities†	152.4	154.1	152.4	167.8
	Metals and Metal Products†	168.9	169.3	167.9	172.0
	†Bureau of Labor Statistics Index. 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

ROBERT W. CLYNE

FRANK G. HELANDER

HENRY M. METCALF

Robert W. Clyne has been appointed manager of the passenger, locomotive and industrial department, Railway Sales Division, **American Steel Foundries,** Chicago. From headquarters in Chicago he will devote his attention to locomotive and passenger equipment, as well as to industrial springs and forgings. Mr. Clyne joined the A.S.F. organization in 1930. He served successively as sales assistant, sales agent, war production engineer, and, since 1946, as assistant vice president. **Armand H. Peycke,** previously in charge of the passenger, locomotive and industrial department, has retired from active duty after 37 years of service but will continue to be available in a consulting capacity, and for special assignments.

—o—

William Frame and **J. D. Isaacks** of **Kerotest Mfg. Co.,** Pittsburgh, have been elected vice presidents of the company. Mr. Frame joined Kerotest recently as works manager after association with National Supply Co. for 14 years as works manager of its Spang-Chalfant plant at Ambridge, Pa. He will continue to serve as works manager in addition to his duties as vice president. Mr. Isaacks has been named vice president in charge of steel valve sales. He was formerly district manager for Kerotest in Houston.

—o—

F. L. MacQuarrie, president, **California Cold Rolled Steel Corp.,** Los Angeles, has retired and is succeeded by **James E. Lewis,** who has served as vice president and general manager since 1940. Mr. MacQuarrie pioneered the production of cold-rolled strip on the Pacific Coast when he founded the company in 1939.

Frank G. Helander has been appointed executive vice president, **Watson-Stillman Co.,** Roselle, N. J. He joined the company in 1943 as midwest sales manager of the Hydraulic Machinery Division, with headquarters in Chicago. He previously had been with Carnegie-Illinois Steel Corp. in engineering at the Youngstown and Homestead Works, and later served as chief engineer of the Ordnance Engineering Bureau of that corporation at Pittsburgh.

—o—

B. J. Fletcher has been named assistant chief hydraulic engineer for **Aluminum Co. of America,** Pittsburgh. He joined Alcoa in 1926 as a member of the hydraulic engineering department, and was made chief engineer, Development Division, in 1944. During World War II Mr. Fletcher was active in development work on military applications for aluminum, and on the atom bomb project.

—o—

E. G. Schroeder has been appointed field sales manager, **Electric Products Co.,** Cleveland. He joined the company in 1945 to head up its Detroit district office. Previous connections include seven years with General Electric Co., and a year with the New York State Electric & Gas Corp.

—o—

Dr. L. P. Moore has been appointed manager of the New Products Development department, **American Cyanamid Co.,** New York, and **Dr. E. W. Cook** has been appointed European technical representative. Dr. Moore has served as European technical representative since 1946, and has been with the company 12 years.

Henry M. Metcalf has been appointed chief industrial engineer, **Republic Steel Corp.,** Cleveland. He was employed as a civil engineer and construction engineer before joining Steel & Tubes Inc., now a division of Republic, in 1929. Mr. Metcalf has served Republic as district industrial engineer in Chicago, industrial engineer in the general office in Cleveland, and since 1939 on the staff of the vice president in charge of operations. As chief industrial engineer he succeeds **W. K. Bonte** who assumes new duties in the company's general accounting department.

—o—

D. L. Irvine has been appointed assistant general manager of sales, and **F. A. McClelland** as manager of sales, Tin Plate Division, **Wheeling Steel Corp.,** Wheeling, W. Va. Mr. McClelland, who has been assistant manager of sales, Tubular Division, succeeds Mr. Irvine in his new appointment. Mr. Irvine succeeds **W. M. Hall,** recently made general manager of sales.

—o—

Thomas J. Watson Jr., vice president and director, **International Business Machines Corp.,** New York, has been elected executive vice president, and **Dause L. Bibby,** general manager of the IBM plant at Poughkeepsie, N. Y., was elected vice president, with headquarters at Endicott, N. Y. **William L. Lewis,** manager of production and engineering, also was elected vice president. **I. Smith Homans Jr.,** assistant to the president, was promoted to executive assistant at the Poughkeepsie factory; **Charles F. McElwain,** factory superintendent at Endicott, was promoted

The Steel Strike

and

Ryerson Steel Service

As these lines are written* the announcement has just been made by the president of the CIO United Steelworkers that the strike, postponed from July 15th, is now in force.

Naturally, the duration, extent and consequences of this stoppage in steel production are unpredictable. But for the sake of our national economy and the welfare of all we hope for a speedy and satisfactory solution.

Fortunately, during the past few months, the condition of Ryerson steel inventories in our thirteen great plants had improved materially. Orders for high quality carbon, stainless and alloy steels were being filled promptly. And during this emergency they will continue to be filled, at our established prices, while our stocks last.

Likewise continued will be our long established policy of providing prompt, personal service whether an order calls for a single bar or a carload. So contact your nearest Ryerson plant for any steel requirements—and we will do our level best to take care of you.

*Saturday, October 1

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK, BOSTON, PHILADELPHIA, DETROIT, CINCINNATI, CLEVELAND, PITTSBURGH, BUFFALO, CHICAGO, MILWAUKEE, ST. LOUIS, LOS ANGELES, SAN FRANCISCO.

RYERSON STEEL

to works manager there; **Homer F. Bookstaver,** assistant superintendent at Endicott, was named factory superintendent.

—o—

Harry N. Bedford has been appointed manager of production planning and control for **Bausch & Lomb Optical Co.,** Rochester, N. Y., succeeding **Milton D. Lemieux,** recently placed in charge of inventory control for the firm's affiliated companies and branch offices throughout the United States.

—o

Vernon W. Kraetsch has been appointed assistant to the comptroller of **American Steel & Wire Co.,** Cleveland, subsidiary, U. S. Steel Corp. He joined the wire company shortly after graduation in 1939 from the University of Illinois. In 1947 he was named Cleveland district works accounting supervisor, and became assistant works accounting supervisor in 1948.

—o—

Lawerence M. Ricketts Jr. has been elected vice president and assistant treasurer, **Poole Foundry & Machine Co.,** Baltimore.

—o—

David Neill has been appointed Cincinnati sales representative for gears, gear units and flexible couplings manufactured at the Buffalo plant of **Farrel-Birmingham Co. Inc.,** Ansonia, Conn. He joined the sales department in 1945 after spending three previous years in the gear manufacturing division.

—o—

Harold Q. Noack has been named division vice president of the central sales division of **Columbia Steel Co.,** with headquarters in San Francisco.

—o—

Arthur A. Leschen has been elected president of **A. Leschen & Sons Rope Co.,** St. Louis, and **Douglas W. Vernon** as vice president and general manager. Mr. Leschen joined the company in 1902. Since 1943 he has served as vice president in charge of production. He succeeds the late **William C. Henning,** president from 1943 until his recent death. Mr. Vernon became associated with Leschen company in 1945 as general manager of sales, and in 1947 was elected vice president in charge of sales. In addition to his new duties he will continue to direct the activities of the sales department.

—o—

John T. Wetzel has been appointed plant manager, **Tube Reducing Corp.,** Wallington, N. J. He was assistant to the president of Curtiss-Wright Corp., New York.

—o—

Col. R. H. Elder, who, since service with the Chemical Corps during 1942-1945 has served as staff writer for **American Cast Iron Pipe Co.,** Birmingham, has returned to his former position as chief chemist. **Roy E. Deas,** who served as acting chief chemist during the interim, has been appointed chief analyst of the company.

—o—

W. J. Fredrick has been named manager of the Newark, N. J., branch of **Mack Trucks Inc.,** New York, with headquarters at 1239 Broad St., and **G. F. Zeller** becomes manager of the New Brunswick, N. J., branch with offices at 438 Raritan Ave.

—o—

Roscoe I. Pease Jr. has joined **Harley-Davidson Motor Co.,** Milwaukee, as salesman for New York, northern tip of Pennsylvania, and the provinces of Ontario and Quebec, Canada.

—o—

James B. Roberts has been appointed Tennessee sales manager of **O'Neal Steel Co.,** formerly Southern Steel Co., Birmingham. He will have headquarters in Chattanooga, Tenn.

ARTHUR A. LESCHEN

DOUGLAS W. VERNON

ROBERT N. LYNCH

Robert N. Lynch has been promoted to sales manager, Heat Treating Materials Division, **Park Chemical Co.,** Detroit. He has been with the company for the last ten years, connected with metallurgical sales and as service engineer in the Michigan-Ohio territory.

—o—

Westinghouse Electric Corp., Pittsburgh, announces appointment of **C. M. Clark** as manager of manufacturing, Transportation & Generator Division. Formerly superintendent of manufacturing for the division, he succeeds **R. H. Timmons,** named manufacturing manager for all Westinghouse industrial products. **Dr. Charles M. Slack,** since 1946 director of research for the company's Lamp Division, Bloomfield, N. J., has been named technical director, Atomic Power Division, to have general direction and co-ordination of all research and engineering work. **Theodore E. Stieber** has been appointed manager of the company's Central Station Division in the firm's Middle Atlantic district. **Guy Kleis,** formerly manager of graduate student training, now becomes manager of the entire educational department, and he is succeeded by **Maynard J. Warneke,** previously supervisor of basic training.

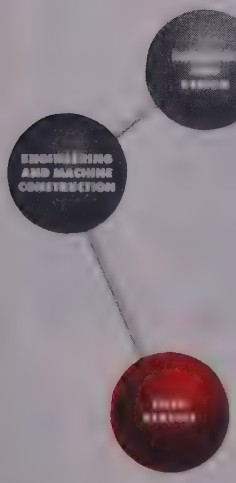
—o—

Morrell H. Blesh has been appointed manager of salary and wage policies, apparatus department, **General Electric Co.,** Schenectady, N. Y. **H. L. R. Emmet,** for the past 21 years works manager of the company's Erie, Pa., works, has retired after more than 36 years' service, and is succeeded by **Bertram Miller,** assistant manager.

—o—

Leslie W. Walker has been appointed sales promotion manager, **Pontiac Motor Division,** Pontiac, Mich., Gen-

IT'S NEVER *"After Hours"* AT LOMBARD...



There's no problem like your problem and we strive for immediate solution. We support this conception of *Urgent Service* with offices in strategic locations, willingness to burn the lamps all night, if necessary, to meet your vital deadlines, and Company-owned aircraft ready to fly our engineers and executives to you on a moment's notice.

Lombard "Packaged Engineering" embraces the entire responsibility of complete plant or machine design... plus construction and installation where required. Give us your toughest construction or mechanical engineering problem and we'll develop the practical, efficient method or process for your profitable production. Trained engineers supervise machinery installation, stay on the job until the equipment is performing the job we designed it to do... that you expect it to do!

INVESTIGATE LOMBARD Packaged Engineering TODAY!

LOMBARD CORPORATION

ENGINEERS AND DESIGNERS

EMPIRE BUILDING • YOUNGSTOWN 3, OHIO

EQUIPMENT MANUFACTURED BY UNITED ENGINEERING AND FOUNDRY CO., PITTSBURGH, PA.

eral Motors Corp. He previously was parts sales manager for the division.

—o—

H. Gottwald has been appointed as-

H. GOTTWALD

sistant sales manager, Nordstrom Valve Division, **Rockwell Mfg. Co.,** Pittsburgh. He has been identified with the company's valve operations since 1928, with experience both in domestic and foreign fields. For the last several years he has concentrated on South American accounts and handled the major part of Rockwell's export operations there. Mr. Gottwald will have headquarters in Pittsburgh where he will supervise and co-ordinate contacts and activities in connection with valve jobbers throughout the country.

—o—

Howard E. Carson has been appointed manager of the market research and sales analysis department, **Willys-Overland Motors Inc.,** Toledo, O. He was formerly manager of market research and sales analysis of Kaiser-Frazer Corp.

—o—

Whiton Machine Co., New London, Conn., announces appointment of **Jack Brewer,** manufacturers' representative in Los Angeles, as its exclusive representative on the sale of lathe chucks, centering machines, special purpose high production milling machines and gear cutting machines in southern California.

—o—

Lawrence P. Quinlivan has been transferred from the Cincinnati branch of **York Corp.,** where he served as industrial sales engineer, to the factory in York, Pa., where he will be in charge of air conditioning sales.

—o—

Frank M. Folsom, president, Radio Corp. of America, New York, has been elected chairman of the board, **National Security Industrial Association,** New York, and **James R. MacDonald,** first vice president, General Cable Corp., was elected president. **Earle W. Mills,** executive vice president, Foster Wheeler Corp.; **J. S. McDonnell,** president, McDonnell Aircraft Corp.; and **Harold Roeschenstein,** president, Owens-Corning Fiberglas Corp., were elected national vice presidents.

—o—

Arthur Colton Co., Detroit, has made the following territorial assignments: **Gordon W. Covey,** formerly with F. S. Stokes Machine Co., has been assigned to assist **Doane Hage** in the New York office; **Roderick A. Bernick,** of the firm of L. O. Bernick Co., Buffalo, will represent Colton in western New York; **Otto E. Pfannkuch & Co.,** Bridgeport, Conn., has been appointed Colton representative for Rhode Island, Vermont, eastern New York and western Massachusetts.

—o—

Harry L. Stiles has been appointed

HARRY L. STILES

vice president in charge of engineering for **Geuder, Paeschke & Frey Co.,** Milwaukee. For the last four years he has been managing engineer for Chicago Electric Mfg. Co., and previously was with General Electric Co. as commercial engineer. The position which Mr. Stiles now takes is a newly created one with Geuder, Paeschke & Frey.

—o—

Frederick Wenzel has been appointed works manager, and **W. C. Christianson** as sales manager of **Trent Tube Mfg. Co.,** subsidiary of Crucible Steel Co. of America, in East Troy, Wis. Mr. Wenzel was plant superintendent and Mr. Christianson assistant sales manager.

—o—

Elected vice presidents of **Consolidated Vultee Aircraft Corp.,** San Diego, Calif., are **Ray O. Ryan,** manager of the company's Ft. Worth, Tex., division, and **R. C. Sebold,** director of engineering for the corporation. Mr. Ryan will continue at Ft. Worth.

—o—

Alonzo J. Edgar has been appointed general manager of **Hunt-Spiller Mfg. Co.,** Boston. He formerly was works manager of Benton Harbor Malleable Iron Co. which he joined in 1946. In 1942 Mr. Edgar, who has a varied experience in all phases of foundry practice and management, was appointed technical director and co-manager of Gray Iron Founders' Society, Washington, where, in addition to assisting member foundries from coast to coast, he served as adviser to Army and Navy procurement agencies in allocating castings requirements.

—o—

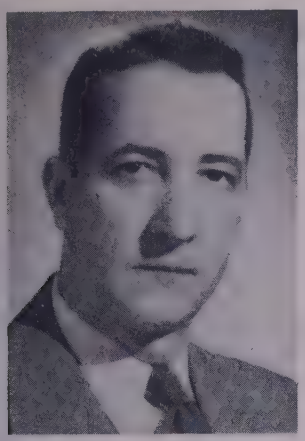
Edward C. Bailey, 1316 Dickerson Rd., W. Englewood, N. J., has resigned as eastern district manager of **Greenfield Tap & Die Corp.,** Greenfield, Mass., after an association of over 31 years. He has been in charge of eastern seaboard sales for the last 11 years. After a short vacation Mr. Bailey intends to become associated again with the small tool industry.

—o—

L. F. A. Mitchell has been appointed sales manager of **Sperry Products Inc.,** Danbury, Conn., to be responsible for administration of sales of Sperry nondestructive testing services and equipment. He previously was manager of headquarters sales, Crocker-Wheeler Electric Mfg. Co., and before that was associated with Westinghouse Electric Corp., at East

L. F. A. MITCHELL

Pittsburgh, Pa., in various sales supervisory capacities, and manager of sales for Canadian Westinghouse Co. Ltd.



GEORGE W. ALTMAN

GUSTAV LAUB

WARD A. MILLER

George W. Altman has been named plant manager of the Trenton, N. J., cast iron radiator foundry of **National Radiator Co.,** Johnstown, Pa., to succeed **E. W. Longacre,** retired because of ill health. Mr. Altman joined the company earlier this year as a foundry engineer. He previously was associated with Hannifin Corp., Chicago, as general manager of its subsidiary, Bridgman Castings Inc., Bridgman, Mich., and with Lennox Furnace Co. Inc., Columbus, O., and Pittsburgh Coke & Iron Co., Pittsburgh.

—o—

A. B. Murray Co. Inc., Elizabeth, N. J., has appointed **William G. Gunlack,** sales representative, and **John J. Lussen,** sales department, to specialize in stainless steel products.

Gustav Laub, formerly assistant vice president and general manager of sales, **Vanadium Corp. of America,** New York, has been elected vice president in charge of sales. **Ward A. Miller,** vice president and director, has been placed in charge of administering and co-ordinating the activities of the corporation's selling and technical divisions dealing with commercial affairs.

—o—

H. S. Warwick has resigned as new industries manager for the Greater Youngstown Area Foundation, Youngstown, to become associated with the **Ohio Manufacturers' Association,** Columbus, O., as public relations secretary. Mr. Warwick joined the Youngstown group in 1946, prior to which time he was associated with the Ohio Manufacturers' Association.

—o—

C. J. Moore, manager, Pittsburgh branch, has been appointed manager of Exide's Railway & Motive Power Sales Division, **Electric Storage Battery Co.,** Philadelphia.

—o—

Robert Krepps has been appointed midwest district sales supervisor for **Denison Engineering Co.,** Columbus, O. He will have headquarters at the company's Chicago office, 11047 S. Hale Ave. Mr. Krepps has been associated with the company 12 years in engineering and sales activities, serving as sales engineer in the hydraulic pump and control division. His new work will include the sales supervision of both the control division and multipress division.

OBITUARIES...

John B. Sutton, 67, president, **Sutton Engineering Co.,** Bellefonte, Pa., died Sept. 25. He has been the company's president and chairman of the board since its formation in 1918. Mr. Sutton had been associated with Crucible Steel Co. of America for a number of years prior to forming the Sutton Engineering Co.

—o—

Lewis L. Middleton, 62, vice president, **Sheffield Steel Corp.,** Kansas City, Mo., died Sept. 19 as a result of a fall at his summer home, Sylvan Beach, Mich. He had been with Sheffield 30 years, first as manager of sales, then in charge of purchasing and raw materials.

—o—

Howard H. Ganson, 64, former sales manager, **Strong Steel Foundry Co.,** Buffalo, died Sept. 23.

—o—

Raymond H. Martin, 55, plant and sales manager, **Bassick-Sack Division,** Bassick Co., in Winston-Salem, N. C., died Sept. 21. He was placed in charge of this division in 1948 and had previously spent more than 25 years with the Bassick Co. at Bridgeport, Conn., subsidiary of Stewart-Warner Corp.

—o—

Lee G. Sullivan, 62, vice president, **Atlas Steel Casting Co.,** New York, died Oct. 3 of a heart attack in White Sulphur Springs, W. Va., where he was attending a convention of the Steel Founders Society of America. He joined the Atlas company 30 years ago as manager of sales in New York.

—o—

William H. Buesser, 73, for 40 years a member of the engineering staff, **American Steel & Wire Co.,** Cleveland, subsidiary, U. S. Steel Corp., died Oct. 3.

—o—

Beverly L. Waters, 74, founder and chairman of the board of **Lyon Metal Products Inc.,** Aurora, Ill., died Sept. 28. He was elected president of the company in 1935, and became chairman on his retirement in 1940.

—o—

W. R. Cunnick, 57, vice president and general sales manager, **Great Lakes Steel Corp.,** Detroit, died Sept. 18.

—o—

Robert A. Weinhardt, 67, automotive power plant engineer, **Willys-Overland Motors Inc.,** Toledo, O., died Sept. 26 after a short illness.

—o—

John Anderson, 65, for 35 years with the accounting department, **Tennessee Coal, Iron & Railroad Co.,** Birmingham, died recently. He retired in 1942 because of ill health.

—o—

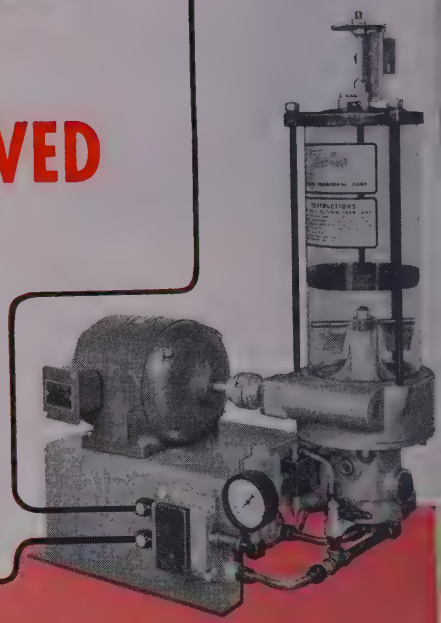
Millard H. Fyler, 45, production manager, **Easy Washing Machine Corp.,** Syracuse, N. Y., died of a heart attack Sept. 27. He was associated with the company for 27 years.

$6,874.00 IN BRONZE BEARING MATERIAL

$3,120.00 IN FINISHED GEARS AND SHAFTS

$2,080.00 IN TIME

Trabon SAVED $12,074.00 ON A 12" MILL IN ONE YEAR!



TOTAL SAVINGS $12,074.00

An Ohio steel manufacturer reports the above savings for a 12-month period following the installation of a Trabon system using two small motor driven pumps with automatic timing cycle. There were 146 table roll bearings involved in the installation.

TONNAGE RECORD BROKEN!

Shortly after installation of this system, the mill record for tonnage was broken, principally because no delays occurred from bearing breakdowns. Add to the above an undetermined amount saved in lubricants!

Trabon oil and grease systems can save you a substantial sum in both materials and time . . . eliminate costly down time and cut repair bills to a new low. *Write or phone today.*

20 years' experience in manufacturing, installing and servicing centralized lubrication systems!

Trabon

OIL AND GREASE SYSTEMS

WRITE FOR YOUR FREE COPY OF BULLETIN 484

TRABON ENGINEERING CORPORATION

1814 EAST 40TH STREET • CLEVELAND 3, OHIO

Engineering News . . . AT A GLANCE

REINFORCED STEEL PAPER—As result of innovations in manufacturing processes, Asphalt Papers Division of Thilmany Pulp & Paper Co., Kaukauna, Wis., is currently turning out a reinforced paper consisting of steel straps laminated between two plies of asphalted kraft material. Production of the product is accomplished with a specially built machine which, in continuous operation, prints identifying and descriptive information on the outer layer of the kraft, applies a double coating of asphalt to the paper plies, inserts steel strapping at regulated intervals, laminating them into a unit.

ABRASIVE RESISTING METAL—In a test run in a Chicago steel mill, rolls surfaced with a hard metal produced by Coast Metals Inc., Canton, O., turned out an average tonnage of 2319 tons, reducing costs per by 79 per cent. Surfaced hot shear knives of another mill were still serviceable after a continuous run of 140 days, processing 298,493 tons of materials.

FAST BOILER TUBE WELDING—New simpler process for welding boiler tubes, developed at Chattanooga, Tenn., plant of Combustion Engineering-Superheater Inc., not only provides time-saving advantages but also makes possible a consistently high quality weld. Principles of induction heating and pressure welding are employed by the method which is used to make tube joints. Both straight and bent tubing may be joined, actual welding time being a few seconds. Use of backing rings is avoided and welds may be made of one alloy steel to another or of alloy steel to carbon steel.

INCREASED HOOK CAPACITY—Structural design improvements in a tramrail crane engineered by Forker Corp., Cleveland, are said to result in reduction of parasite weight, effecting savings up to 50 per cent of the weight of other cranes rated at similar load capacities. According to the company, this results in increased hook capacity, greater payloads and lowered operator fatigue. Reduced drawbar pull also provides faster operation.

WIDENS MOUNTING POSSIBILITIES—Stator frame of a new line of 20 to 75-horsepower, alternating current induction motors currently in production at the Buffalo plant of Westinghouse Electric Corp., is made of solid heavy rolled steel. To control inner diameter accurately enough to accommodate the stator laminations properly, the frame is rolled from flat steel and welded into a ring while on a mandrel. Solid frame not only provides better protection, but permits the motor to be wall or ceiling mounted with equal protection.

CORROSIVE RESISTING MATERIALS—Outstanding resistance to a wide variety of chemicals and corrosives, resistance to abrasion, high dielectric strength are among advantages cited for the new plastic materials developed by Organic Coatings Division, United Chromium Inc., New York. They can be applied as coatings to metal by dipping, spraying or brushing and, on baking for 20 to 30 minutes, they set and take on a rubber-like appearance. The company reports coatings 0.003 to 0.25-inch may be obtained with a single application. Materials are particularly suitable for coating pipes, tanks, drums and tool handles.

METAL SHOW—This year, the metal congress and exposition come at a most opportune moment. It is the first ASM-sponsored gathering since 1938 at which the majority of those attending are seriously concerned with problems posed by a buyers' market for metal products. Guy Hubbard, Machine Tool Editor, points out that this goes for exhibitors as well as for the men who will walk the aisles. Timeliness of the show is bound to key up salesmen in the booths to concert pitch. At the same time it makes intensive, critical, comparative study of exhibits and congress papers literally a matter of economic life or death to thousands of customers and prospects faced with immediate necessity for discovering ways and means for improving design and manufacture of their products—at the same time cutting costs right to the bone. (p. 116)

OLD BUT EFFECTIVE — The old stone blast furnace is now a thing of the past. But another "landmark" of the early days of the iron industry still remains—that of the hand-filled blast furnace. When the Mary furnace of the Sharon Steel Corp. at Lowellville, O., outlives its usefulness, it too will be an event of history, because "she" is the last of the hand-filled stacks. The first furnace in the United States to use raw coal, the Mary was blown in during the late summer of 1846. Today, standing 81-feet tall, the several times remodeled stack provides an output greater than her 350-ton rated capacity. (p. 136)

AIDS RESEARCH—Fundamental advance in organization, storage and dissemination of knowledge is foreseen in an electronic "brain" unit developed jointly by the Departments of Commerce and Agriculture. The machine stores vast amounts of research information. In action, it literally pores over the material, selects what is sought by the operator, then hands him copies of what he wants. Details of the unit, which makes use of 35 mm film, were worked out by Engineering Research Associates of Minneapolis. The unit's photoelectric eyes scan the film at a rate of more than 60,000 subjects per minute. Contents of almost 500,000 conventional library cards are "stored" on each reel.

Major problem today in manufacture of metal products is to attain adequate strength and endurance with minimum material. Metallurgists and product engineers depend on modern testing equipment for physical checks on their selection and design

Stiffening Competitio

With customers of the metalworking industry now demanding better products at lower prices, the 1949 Metal Congress and Exposition come at a most opportune moment. The hundreds of technical sessions and exhibits emphasizing the latest ways and means for effecting economy in production, will be of immediate help to many metallurgists, designers and production executives in improving quality and cutting cost

By GUY HUBBARD
Machine Tool Editor, STEEL

THIRTY-ONE years ago a new and little-known society of "steel treaters"—destined to become the American Society for Metals—staged the first of a continuing series of annual metal shows. It would indeed have been a bold prophet who would have predicted that in 1949 the direct descendant of that original show would fill such a huge structure as the Cleveland Public Hall and annex with more than 300 exhibits, which would draw more than 30,000 visitors.

Had it remained strictly a metal show, it probably never would have developed to any such extent. Nor would it be of any such overall service to industry as is the case of the Exposition and Metal Congress as we know it today. Due to the system under which American production metalworking industries now are set up, selection of metals, design of metal parts, cutting, forming and fabricating of those parts, their metallurgical treatment, their inspection, their finishing and methods of assembly all are intimately related. The manufacturing, inspection and assembling phases in many cases are actually tied together and co-ordinated in conveyorized production and assembly lines.

That is why the latest developments in the broad and related fields of materials, methods and machines will be demonstrated so effectively and explained so completely during the course of the 1949 Metal Congress and Exposition. Obviously all this is of interest and value not alone to metallurgists, but equally so to designers and product engineers, to tool and production engineers, to inspectors, to ambitious shop men, to business executives sincerely concerned over profitable operation of their plants and to sales executives "constructively worried" about competitive standing of their products in terms of design, quality and cost.

Concerned with Buyers' Market—This is the first ASM Exposition and Congress since 1938 at which the majority of those attending are seriously concerned with problems posed by a buyers' market for metal products. That goes for exhibitors as well as for the men who will walk the aisles. That state-of-affairs is bound to key up the salesmen in the booths to concert pitch. At the same time it makes intensive, critical, comparative study of exhibits and congress papers literally a matter of economic life or death to thousands of customers and prospects faced with immediate necessity for discovering ways and means for improving design and manufacture of their products and at the same time cutting costs right to the bone. Things will be strictly business at the great ASM market place—the business being the buying and selling of the latest materials and equipment and ideas involved in "Economy in Production".

For the person with limited time available, the problem of covering adequately an affair as large in size and in scope as the Metal Show and Congress always is a difficult one. It is one which requires careful advance planning for proper solution. An affair of this kind can be all things to all people depending, in the case of each individual, upon what his primary interests, and what his company's primary interests are in sending the individual to Cleveland.

The experience of the writer—on the basis of 35

nd Mounting Labor Costs

Dictate Re-Appraisal of Materials, Methods and Equipment

years of attending industrial conventions and exhibitions—is that preliminary study of the program, the list of exhibits and the diagram of the halls which are published in this issue of STEEL, will help tremendously in laying out a workable and profitable individual itinerary. As a matter of fact this material is presented with that idea in mind. A lot of thought has been given toward making it conveniently usable for this very purpose.

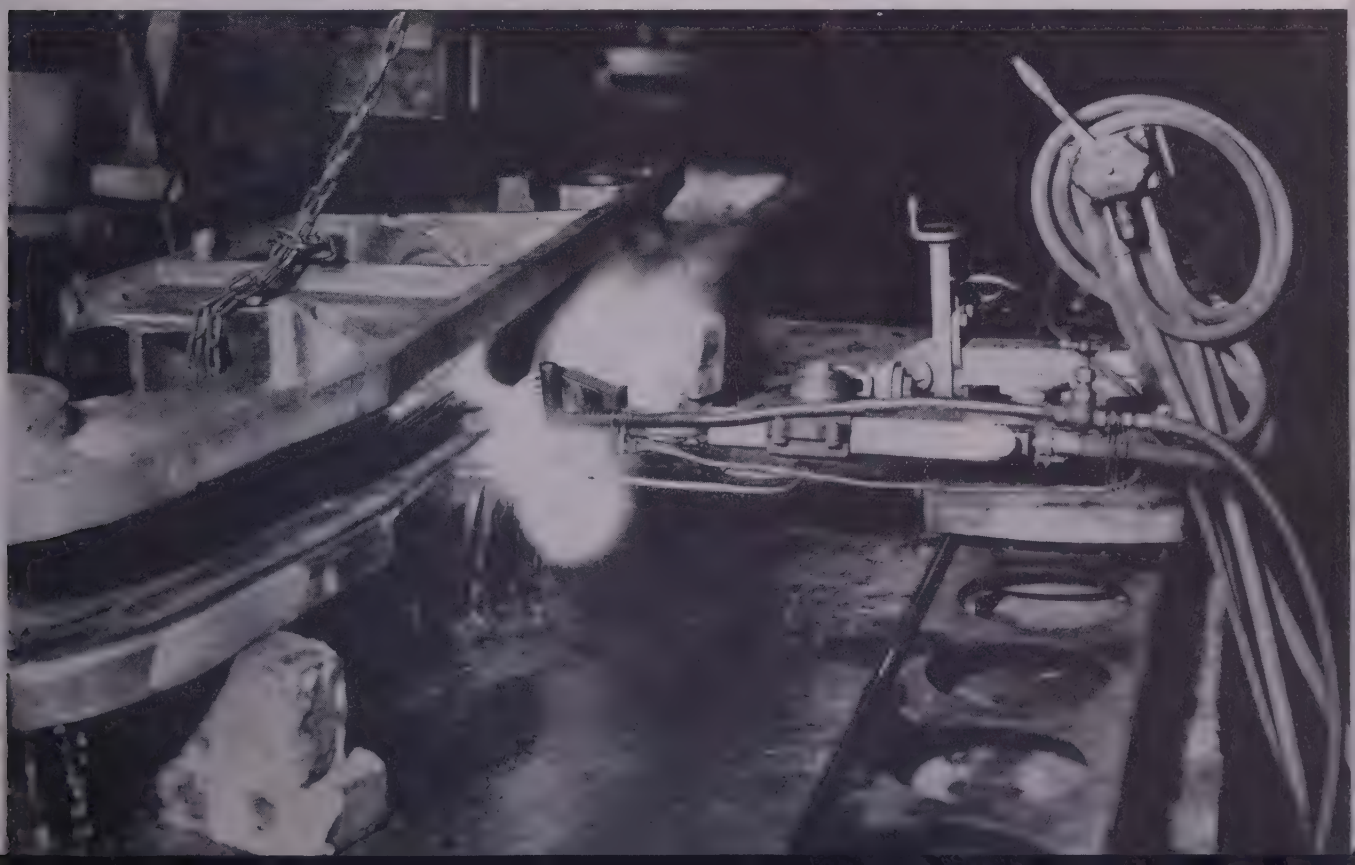
Interests Really Broad—An individual seldom realizes how broad his interests actually are until study of the interlocking character of modern specialized subjects in industry is made. As a help to self-analysis along this line, let us take a look at some of the major heads under which ASM lists the interests of its membership. No attempt is made here to list these in order of importance for the simple reason that there is no such order. What is important to one, may be of little or no interest to another. Hence the list may seem rambling.

Starting with the basic subject of materials, come smelting and refining; properties; and constitution and structure. Moving on into what happens to materials, we run into powder metallurgy; corrosion and its prevention; cleaning and finishing; and electrodeposition and electrofinishing. In the realm of the laboratory and inspection, we encounter physical and mechanical testing; analysis; apparatus and instruments; inspection and standardization; and temperature measurement and control.

Continuing our ramble over the field we encounter foundry practice (including such refinements as die casting, permanent mold casting and the lost wax processes); and scrap and by-product utilization. Related to these are furnaces and other heating devices; refractories and furnace materials; and heat treatment.

Along the production lines we run into press working and forging; machining and machinability; and miscellaneous fabrication methods. Then come joining and flame cutting (under which head come welding, brazing, etc.). Then under the general heads of applications and design lie a multitude of possibilities.

Regardless of the limitations on time, and regardless of the care with which the itinerary has been mapped out in advanced, the writer has found that it invariably is desirable to make one "whirlwind tour" of an entire exhibit before concentrating on details.



Precisely controlled, localized heat has taken its place as one of the precision tools in the processing of metal surfaces

Oftentimes one will discover in passing, details which have been overlooked in the "mapping".

These are apt to be new and important things. They can be "spotted" for a return visit. The whirlwind tour should not be interrupted. Its object is to give an overall perspective of the whole show.

Check Your Coverage—Having made your whirlwind tour, you may have noticed certain things which will cause you to want to re-evaluate your coverage of the congress sessions as well as of the show itself. Find a quiet spot and take a little time to re-mark your exhibitors' list, your map and your program. That also will give your tired feet a needed rest. In case you are not trying to cover the show alone, this is a good time to subdivide the task of coverage among the group—whose individual "findings" later can be consolidated into a group report.

These are days of quick technological and industrial upsets due to new materials, methods and machines. You are at the show to detect those possibilities so that you can orient your future design, production and inspection activities accordingly. Don't skimp on time or manpower while the show and congress are in action. An extra day or an extra observer dedicated to some "hot" discovery which you make on your whirlwind tour may mean a full reservoir of new knowledge which will be the salvation of some important phase of your business.

Cost-Saving Methods "In Action"—In your analysis of the program, don't overlook the industrial moving pictures which will be shown in the "Economy Theaters" during the show. These are top-flight films whose subjects include aluminum and its applications, sheet and plate cutting methods, industrial uses of photography, latest developments in welding, welded designs, steel shapes in industry, mass production of big work, die casting techniques, induction heating in the forge shop, cleaning of automotive parts, tool grinding methods, mechanized materials handling, assembly methods, radio frequency heating, and matters involved in jet engine manufacture.

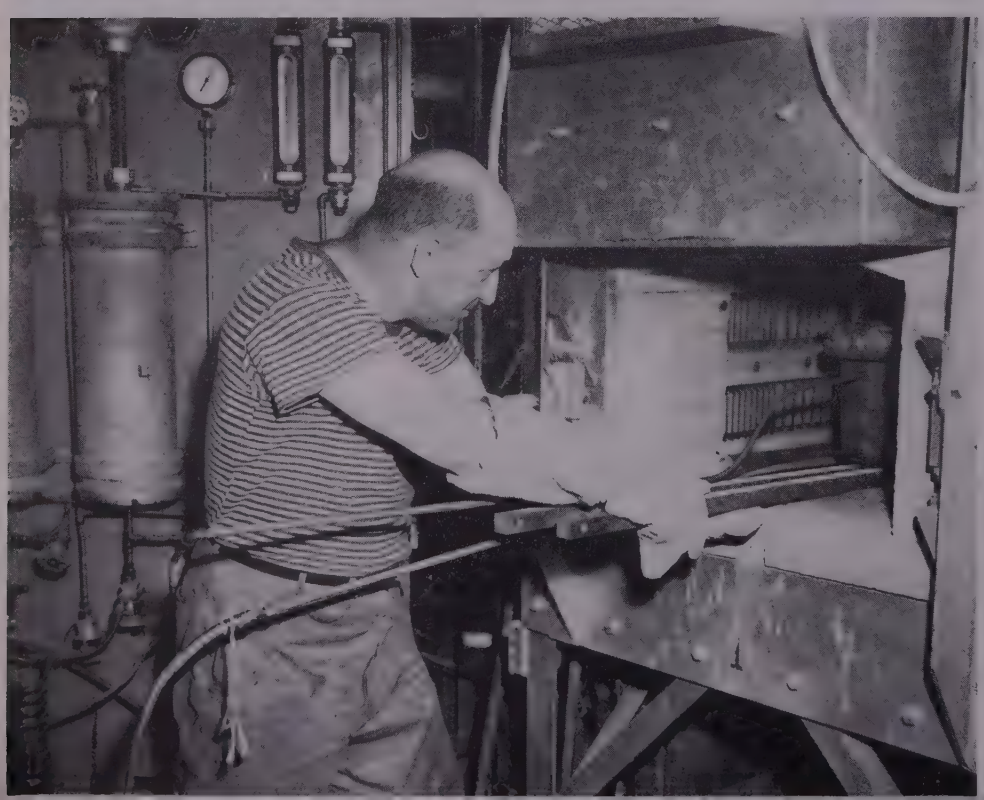
Like the person who couldn't see the forest because of the trees, there is danger that an observer at a huge show such as that of ASM will lose sight of main objectives in the tremendous multiplicity of exhibits. To help in keeping the main objectives in view it will be well to remember a few basic things. First and foremost, remember that your primary reason for being at the show is to discover ways and means to make better things cheaper.

From the standpoint of materials, that means among other things that you must look for something which is equal to what you are using but less expensive, which is stronger than what you are using and of which you will need to use less quantity, that can be processed with less scrap loss, that can be processed cheaper, that will require little or no finishing, that will have increased sales appeal.

Conservation Important—In the realm of methods and machines, some of the goals you should aim at are materials conservation, as for example getting more metal into parts and less into chips or other scrap, power conservation through elimination of machining, freer cutting and reduction of the number of operations required. Conservation of heat through elimination or localization of heating operations, insulation and fuel efficiency. Elimination of spoiled work through testing of raw materials, nondestructive testing of parts in process, and mechanized inspection and gaging between operations. Conservation of manpower through mechanization of transferring, processing, inspection and assembly.

In following through on manpower conservation, keep safety constantly in mind. Accidents represent the most inexcusable loss of manpower. No process deserves consideration unless every possible hazard has been designed out.

When Charles Dawes took up his duties as ambassador to the Court of St. James, he found the job to be "easy on the head but tough on the feet". Your job as ambassador to the metal show and congress, however, calls for efficient use of brains and feet.



Typical of the manner in which science has rolled up its sleeves and gone to work in the plant is this picture of a naval ordnance expert charging a heat treating furnace with a batch of newly developed magnetic alloy of high efficiency. Official U. S. Navy photograph

ATIONAL METAL CONGRESS & EXPOSITION TO EMPHASIZE ECONOMY IN PRODUCTION

Ideas to meet coming competition to be sought by metalworking executives attending the metal show in Cleveland, Oct 17-21

EVERAL weeks ago, STEEL pointed out U. S. economy historically progressed through three stages oon after a war—immediate boom period, shakeout nd expansion—that the shakeout period was already nding for many industries, complete readjustment of ll industries being predicted by early 1950.

If calculations of the economic specialists are true, heme "economy in production" will take on added eaning to thousands expecting to visit the American ociety for Metals-sponsored 31st National Metal Conress and Exposition in Cleveland, Oct. 17-21. The etal show this year with emphasis on cost-cutting ethods should supply production executives with any ideas to meet coming competition.

Many Activities Planned—Ideas will come not only rom booths of the more than 300 exhibitors in huge ublic Auditorium, but also from the 291 technical apers scheduled by the four participating societies —American Society for Metals, American Welding ociety, Institute of Metals Division, American Institute of Mining and Metallurgical Engineers and Soiety for Non-Destructive Testing. They will come rom pre-show seminar sessions sponsored by ASM, aturday and Sunday, Oct. 15 and 16 at Hotel Statler, rom round table discussions, lecture and educational eries, special industrial movies and other special getogethers planned by all organizations.

Technical sessions of ASM take place at both Public uditorium and Hotel Statler, climaxed by the Campell memorial lecture to be presented Wednesday orning by Edgar H. Dix Jr., assistant director of esearch and chief metallurgist, Aluminum Co. of merica. Those of AWS are at Hotel Cleveland. Both ocieties are to be active the entire week. AIME essions are scheduled Monday through Wednesday t the Allerton Hotel, and those of SNT at the Statler, Wednesday and Thursday. Exposition itself is to be open from noon until 10:30 p.m. the first three days, from 10 a.m. until 6 p.m. Thursday and Friday.

To Receive Awards—During show week five men are to be honored by ASM and AWS. The former will present the Sauveur achievement award to Dr. Marcus A. Grossmann, director of research, Carnegie-Illinois Steel Corp., for pioneering metallurgical achievements. Former Sauveur award winner, Dr. Edgar Collins Bain, vice president, Carnegie-Illinois Steel Corp., is to receive the Gold Medal award for outstanding work in metallurgy. The 1949 Medal for Advancement of Research is to be awarded to Fred H. Haggerson, president, Union Carbide & Carbon Corp., one of industry's leading exponents of consistent research. All ASM awards will be made at the annual dinner Thursday, Oct. 20, in Statler's Grand Ballroom. Charles R. Cox, president, Carnegie-Illinois Steel Corp., is to be the main speaker of the evening.

Men to be honored by AWS include A. G. Bissel, principal engineer, Bureau of Ships, Navy, and W. M. Wilson, professor of structural engineering, University of Illinois. The former is to receive the Samuel Wylie Miller Memorial Medal. The latter is to be recipient of the Adams award, and will present the annual lecture. During that evening at Hotel Cleveland, Monday, Oct. 17, A. F. Davis Undergraduate Welding award is to be made in form of cash prizes to authors and publications for best welding articles.

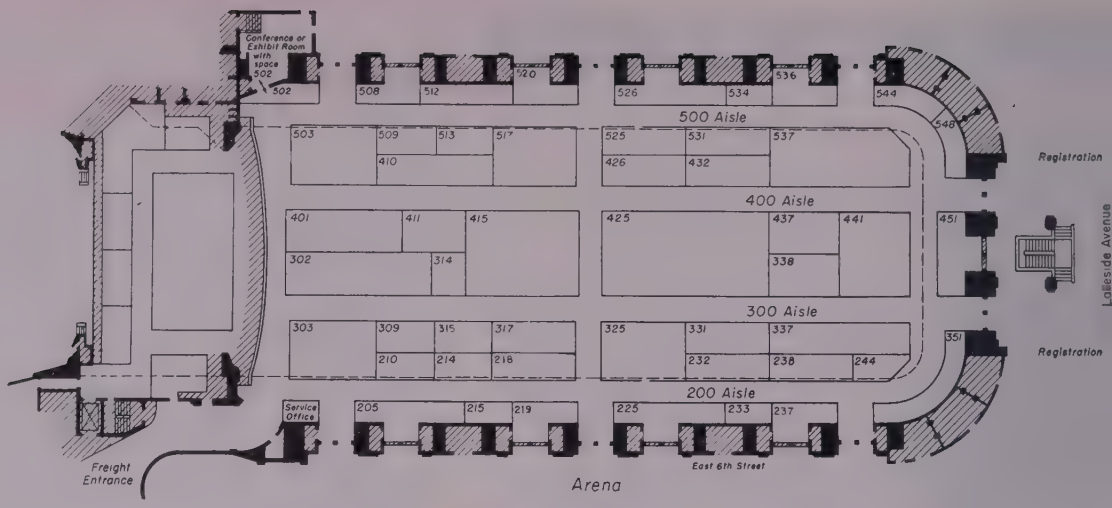
New Officers—Arthur E. Focke, research metallurgist, Diamond Chain Co., Indianapolis, is to be ASM's new president, taking office Oct. 19. He succeeds Harold K. Work, director of research, New York University. New president of AWS for 1949-50, O. B. J. Fraser, assistant manager, development and research, International Nickel Co., New York, succeeds G. N. Sieger, president, SMS Corp., Detroit. Both L. E. Young, consulting mining engineer, Pittsburgh, president of AIME, and Dana W. Smith, chief research metallurgist, Permanente Metals Corp., Spokane, president of SNT, remain in office.

O. B. J. FRASER
President, AWS, 1949-50

ARTHUR E. FOCKE
Vice President, ASM 1948-49; President, 1949-50

L. E. YOUNG
President AIME

DANA W. SMITH
President, SNT

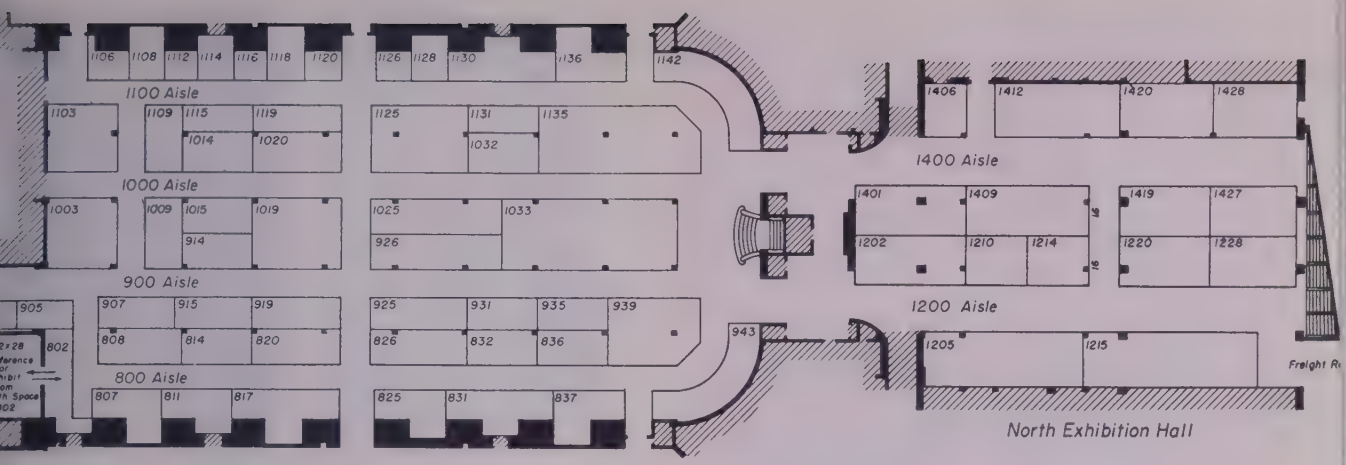


EXHIBITORS

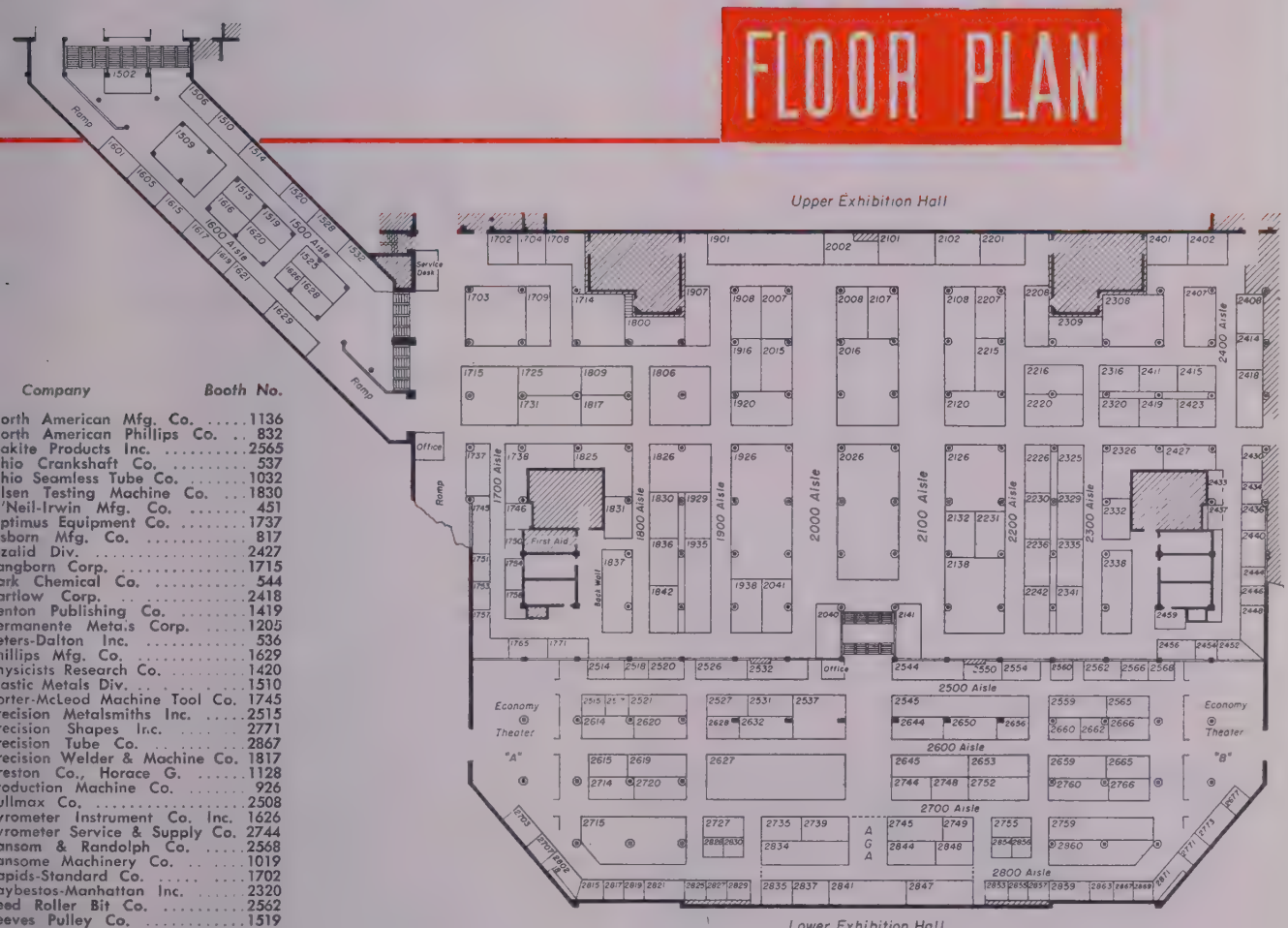
At Public Auditorium
East Sixth and Lakeside Avenues, Cleveland

Exposition Hours: Monday, Tuesday and Wednesday, Oct. 17, 18 and 19, 12 noon to 10:30 p.m.; Thursday and Friday, Oct. 20 and 21, 10:00 a.m. to 6:00 p.m.

Company	Booth No.
Acme Mfg. Co.	826
Acme Steel Co.	1836
Acme Tool Co.	1758
Air-Flo Compressor Co.	1750
Air Force	2715
Air Reduction Sales Co.	2126
Ajax Electric Co.	1901
Ajax Electrothermic Corp.	1901
Ajax Engineering Corp.	1901
Allen Mfg. Co.	1615
Allis-Chalmers Mfg. Co.	1215
Allison Co.	2008
Alloy Casting Co. Div	210
Alloy Engineering & Casting Co.	210
Aluminum Co. of America	2627
American Agile Corp.	2517
American Brake Shoe Co.	325
American Brass Co.	331
American Chain & Cable Co. Inc.	925
American Cyanamid Co.	1704
American Emblem Co.	1809
American Forge Div.	325
American Gas Association	2844
American Gas Furnace Co.	2745
American Machine & Metals Inc.	1709
American Manganese Steel Div.	325
American Non-Gran. Bronze Co.	2819
American Optical Co.	1617
American Platinum Works	2242
American Pullmax Co. Inc.	2521
American Society for Metals	2759
American Wheelabrator & Equipment	2016
Ames Precision Machine Works	2817
Ampco Metal Inc.	315
Anchor Drawn Steel Co.	1401
Anker-Holth Mfg. Co.	2650
Arcos Corp.	1125
Army, Department of	2715
Aronson Machine Co.	2540
Arwood Precision Casting Corp.	2411
Assembly Products Co.	2588
Aurora Metal Co.	1620
Austenal Laboratories Inc.	931
Auto Arc-Weld Mfg. Co.	2566
B-A Coupling Co. Inc.	1528
Baker & Co. Inc.	2419
Baldwin Locomotive Works	1033
Bastian-Blessing Co.	437
Bath Corp., Cyril	2138
Bausch & Lomb Optical Co.	432
Bede Products Inc.	2857
Bishop & Co., J.	2007
Black Drill Co.	303
Blakeslee & Co., G. S.	2236
Braeburn Alloy Steel Corp.	317
Bridgeport Brass Co.	825
Bruning Co. Inc., Charles	2101
Brush Beryllinum Co.	2554
Brush Development Co.	1114
Buehler Ltd.	513
Bundy Tubing Co.	1214
By-Products Steel Co. Div.	503
Campbell Machine Div.	925
Carpenter Mfg. Co.	1528
Central Scientific Co.	1506
Champion Rivet Co.	531
Cheston Co. Inc.	2748
Cincinnati Milling & Grinding Machines Inc.	1826
Cities Service Oil Co.	919
Clark Sales Corp.	1528
Cleco Division	2562
Cleveland Electric Illuminating Co.	526
Cleveland Punch & Shear Works Co.	1837
Climax Molybdenum Co.	338
Clinton Machine Co. Inc.	219
Coast Metals Inc.	2329
Colonial Steel Div.	1401
Commerce Pattern Foundry & Machine Co.	2015
Commercial Shearing & Stamping Co.	1738
Consolidated Engineering Corp.	2514
Continental Industrial Engineers Inc.	2744
Contour Marker Corp.	2031
Crane Packing Co.	836
Dayton Rogers Mfg. Co.	2107
Delta File Works Inc.	1753
Detrex Corp.	1210
Detroit Testing Machine Co.	1616
Dietert Co., Harry W.	214
Distillation Products Inc.	1907
DoAll Co.	1135
Doughty Laboratories	534
Dow Chemical Co.	401
Driver Co., Wilbur B.	1427
Ecco High Frequency Corp.	2748
Eclipse Fuel Engineering Corp.	2847
Ekstrand & Tholand Inc.	2532
Electric Furnace Co.	1014
Electro Alloys Division	325
Elgin National Watch Co.	351
Engineered Castings Div.	325
Erickson Tool Div.	808
Eutectic Welding Alloys Corp.	1703
Fawick Airflex Co. Inc.	2537
Ferner Co., R. Y.	548
Ferrotherm Corp.	2632
Foote Mineral Co.	2132
Forest City Foundries Co.	1108
Foster Transformer Co.	1025
FOUNDRY	1419
Fulton Foundry & Machine Co.	811
Gas Appliance Service Inc.	2739
Gas Machinery Co.	2835
General Alloys Co.	441
General Aniline & Film Corp.	2427
General Electric Co.	2108
Globe Stamping Div.	907
Goodrich Co., B. F.	1916
Gordon Co. of Ohio, Claud S.	2744
Gray Iron Founders' Society, Inc.	2859
Gulf Oil Corp.	837
H & H Research Co.	1758
HPL Mfg. Co.	1825
Hamilton Mfg. Co.	2141
Hammond Machinery Builders Inc.	1142
Handy & Harman	337
Harco Corp.	1806
Harnischfeger Corp.	1806
Harper Electric Furnace Corp.	1106
Harshaw Chemical Co.	1532
Haskell Mfg. Co. Inc.	2802
Hauck Mfg. Co.	2703
Hayes Inc., C. I.	1842
Haynes-Stellite Co.	1926
Heil Process Equipment Corp.	2628
Heppe steel Co.	1115
Hevi Duty Electric Co.	509
Hobart Brothers Co.	2544
Holcroft & Co.	2614
Hones Inc., Charles A.	2848
Houghton & Co., E. F.	939
Hupp Corp.	907
Illinois Testing Laboratories, Inc.	935
Instant Tool Corp.	2869
Institute of Industrial Launderers, Inc.	1757
International Nickel Co. Inc.	302
Invincible Vacuum Cleaner Mfg. Co.	2520
Ipsen Industries Inc.	2645
Jackson Products	2660
Janney Cylinder Co.	2316
Jarrell-Ash Co.	1228
Jelliff Mfg. Corp., C. O.	2666
Jensen Specialties Inc.	2325
Kanthal A. B.	2666
Kelley Co., J. W.	1601
Kemp Mfg. Co., C. M.	2834
Kennametal Inc.	520
Kent Co. Inc.	2644
King, Andrew	244
Knapp Mills Inc.	1708
Kold-Hold Mfg. Co.	1514
Krouse Testing Machine Co.	1514
Kux Machine Co.	1020
Laboratory Equipment Corp.	2773
Lake City Malleable Co.	2338
Lakeside Machinery Co.	2727
Lakeside Steel Improvement Co.	232
Laminated Shim Co. Inc.	1128
Lead-Lined Iron Pipe Co.	1708
Leeds & Northrup Co.	1409
Lepel High Frequency Laboratories, Inc.	2102
Leslie Welding Co.	1619
Lewis Machine Co.	831
L'Hommedieu & Sons Co., Chas. F.	2120
Lincoln Electric Co.	410
Lindberg Engineering Co.	1509
Linde Air Products Co.	1926
Lips-Rollway Corp.	1109
Liquid Carbonic Corp.	1114
Lithium Co.	2745
Livingstone Engineering Co.	2825
Lukens Steel Co.	503
MACHINE DESIGN	1419
Magnaflux Corp.	1015
Magnetic Analysis Corp.	1119
Magnetrode Corp.	2825
Malleable Founders Society	2041
Manhattan Rubber Division	2320
Martindale Electric Co.	2650
Master Builders Co.	1763
May-Fran Engineering Inc.	1130
Merrill Brothers	177
Metal & Thermit Corp.	1933
Michiana Products Corp.,	23
Milburn Co.	2863
Miller Electric Mfg. Co.	2520
Miller Co., J. C.	2340
Milne & Co., A.	31
Mir-O-Col Alloy Co.	1120
Miskella Infra-Red Co.	81
Monarch Aluminum Mfg. Co.	2820
Morton-Gregory Corp.	2230
Moto-Truc Co.	2200
National Bearing Div.	32
National Carbon Co. Inc.	1920
National Diamond Laboratory	2700
National Lead Co. 2559 &	1113
National Radiator Co.	1510
National Research Corp.	2660
National Spectrographic Labs. Inc.	122
Navy, Dept. of	2715
Nelson Stud Welding Div.	2230
NEW EQUIPMENT DIGEST	1410
New Jersey Zinc Co.	41
Nickel Plate Railroad	22



FLOOR PLAN



Company	Booth No.
orth American Mfg. Co.	1136
orth American Phillips Co.	832
akite Products Inc.	2565
hio Crankshaft Co.	537
hio Seamless Tube Co.	1032
lsen Testing Machine Co.	1830
'Neil-Irwin Mfg. Co.	451
ptimus Equipment Co.	1737
sborn Mfg. Co.	817
zalid Div.	2427
angborn Corp.	1715
ark Chemical Co.	544
artlow Corp.	2418
enton Publishing Co.	1419
ermanente Meta.s Corp.	1205
eters-Dalton Inc.	536
illips Mfg. Co.	1629
ysicists Research Co.	1420
astic Metals Div.	1510
orter-McLeod Machine Tool Co.	1745
recision Metalsmiths Inc.	2515
recision Shapes Inc.	2771
recision Tube Co.	2867
recision Welder & Machine Co.	1817
reston Co., Horace G.	1128
roduction Machine Co.	926
ullmax Co.	2508
rometer Instrument Co. Inc.	1626
rometer Service & Supply Co.	2744
ansom & Randolph Co.	2568
ansome Machinery Co.	1019
apids-Standard Co.	1702
aybestos-Manhattan Inc.	2320
eed Roller Bit Co.	2562
eeves Pulley Co.	1519
evere Copper & Brass Inc.	1003
eynolds Metals Co.	1412
ichards Co., J. A.	1126
ehle Testing Machine Div.	1709
iverside Metal Co.	2231
lock Inc.	820
oemelin Mfg. Co.	2615
erson & Son Inc., Joseph T.	411
afety Clothing & Equipment Co.	1515
Regis Sales Corp.	2815
alkover Metal Processing	1520
andvik Steel Inc.	512
hrader's Son Div., A.	2335
ovill Mfg. Co.	1220
las Corp. of America	2841
elers Engineering Co.	2837
ntry Co.	1131
ell Oil Co. Inc.	1731
ocony-Vacuum Oil Co. Inc.	2619
outh Bend Lathe Works	807
pencer Turbine Co.	2735
perry Products Inc.	1920
andard Alloy Co.	915
Standard Electric Tool Co.	1628
Standard Oil Co. of Ohio	1800
STEEL	1419
Sterling Tool Products Co.	2720
Stimpson Co. Inc. Edwin B.,	2207
Stokes Machine Co., F. J.	2040
Stone Machinery Co. Inc.	2201
Stuart Oil Co. Ltd., D. A.	426
Sun Oil Co.	1725
Superior Carbon Products Inc.	233
Superior Foundry Inc.	218
Superior Tube Co.	2527
Surface Combustion Corp.	517
Technical Metal Processing	1520
Tempil Corp.	525
Tennant Co., G. H.	1525
Texas Co.	2415
Tide Water Associated Oil Co.	2821
Timken Roller Bearing Co.	943
Tin Research Institute Inc.	1502
Tinnerman Products Inc.	238
Titanium Alloy Mfg. Div.	1112
Tomkins-Johnson Co.	2216
Torrington Mfg. Co.	1103
Towmotor Corp.	2545
Turco Products Inc.	1406
Uddeholm Co. of America Inc.	205
Udylite Corp.	425
Union Carbide & Carbon Corp.	1926
U.S. Hoffman Machinery Corp.	2332
U. S. Reduction Co.	1715
Universal-Cyclops Steel Corp.	2215
Uniworld Research Corp.	2828
Upton Electric Furnace Div.	2015
Vanadium-Alloys Steel Co.	1401
Vanadium Corp. of America	914
Vapor Blast Mfg. Co.	1831
Wagner Rustproofing Co.	2830
Wall Chemical Div.	1116
Wall Colmonoy Corp.	508
Wellman Bronze & Aluminum Co.	2620
Wells Mfg. Corp.	1908
Wells & Sons, W.F.	2002
Wells, Inc. Martin	2518
Westinghouse Electric Corp.	2026
Wheelco Instruments Co.	2226
Wilson Mechanical Instrument Co.	925
Worthington Pump & Machinery Corp.	1019
Wright, Wilbur J.,	1128

American Society for Metals Seminar on

THERMODYNAMICS IN PHYSICAL METALLURGY

At Hotel Statler, E. 12th St. and Euclid Ave., Cleveland, Saturday and Sunday, Oct. 15 and 16 (two days preceding regular opening of the 31st National Metal Congress and Exposition)

Saturday, Oct. 15—9:30 a.m.

"Principles of Thermodynamics," by P. W. Bridgman, professor of mathematics, Harvard University

"Contributions of Statistical Mechanics," by C. Zener, associate director, University of Chicago, Institute for the Study of Metals

"Application of Thermodynamics to Heterogeneous Equilibria," by L. S. Darken, research chemist, U. S. Steel Corp.

"Application of Electromotive Force Measurements to Phase Equilibria," by F. J. Dunkerley, assistant professor of metallurgy, University of Pennsylvania

Saturday, Oct. 15—2:00 p.m.

"Some Physical Interpretations of Constitution Diagrams," by A. W. Lawson, associate professor of physics, University of Chicago, Institute for the Study of Metals

"Thermodynamics of Liquids," by John Chipman, professor and head, Department of Metallurgy, Massachusetts Institute of Technology and John F. Elliott

"Physical Factors Affecting Order," by C. E. Birchenall, assistant professor of metallurgy, Carnegie Institute of Technology

Saturday, Oct. 15—8:00 p.m.

"Mechanism of Diffusion," by Frederick Seitz, professor and head, Department of Physics, Carnegie Institute of Technology

"Nucleation," by J. H. Hollomon, research associate, General Electric Co.

Sunday, Oct. 16—9:30 a.m.

"Precipitation," by Charles Wert, University of Chicago, Institute for the Study of Metals

"Eutectoid Decompositions," by John Fisher, research associate, General Electric Co.

"Martensite Transformations," by Morris Cohen, professor of metallurgy, Massachusetts Institute of Technology

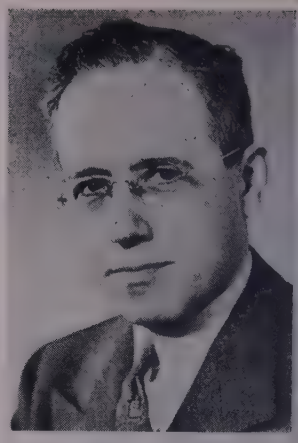
Sunday, Oct. 16—2:00 p.m.

"Magnetic Domains," by Lieuwe Dijkstra, research associate, University of Chicago, Institute for the Study of Metals

"Principles Governing Solidification," by D. Turnbull, research associate, General Electric Co.

"Role of Thermodynamics in Metallurgical Research," by J. B. Austin, director, U. S. Steel Corp. Research Laboratories

E. C. BAIN
Vice President, Carnegie-Illinois Steel Corp. Winner, ASM Gold Medal, 1949



MARCUS A. GROSSMANN
Director of Research, Carnegie-Illinois Steel Corp. Winner, ASM Sauveur Achievement Award, 1949

AMERICAN SOCIETY FOR METALS

PROGRAM

All Sessions at Hotel Statler, Oct. 17 to 21

Monday, Oct. 17—9:30 a.m.

Alloy Steels Session—I

Joint Chairmen

W. R. BREELER, Allegheny-Ludlum Steel Corp.
M. F. HAWKES, Carnegie Institute of Technology

"Tensile Properties of a Heat Treated Low Alloy Steel at Sub-Zero Temperatures," by E. J. Ripling, research associate, Case Institute of Technology

"Relationship of Inclusion Content and Transverse Ductility of a Chromium-Nickel-Molybdenum Gun Steel," by John Welchner, metallurgical engineer, and Walter G. Hildorf, metallurgical consultant, Timken Roller Bearing Co.

"Effect of Vanadium and Carbon on the Constitution of High Speed Steel," by Donald J. Blickwede, head, High Temperature Alloys Section, Naval Research Laboratory; Morris Cohen, professor of physical metallurgy, Massachusetts Institute of Technology; and George A. Roberts, Vanadium-Alloys Steel Co.

"Unnotched Impact Strength of High Speed Steels," by Arthur H. Grobe, research metallurgist, and George A. Roberts, chief metallurgist, Vanadium-Alloys Steel Co.

Monday, Oct. 17—2:00 p.m.

Alloy Steels Session—II

Joint Chairmen

R. S. ARCHER, Climax Molybdenum Co.
G. A. ROBERTS, Vanadium-Alloys Steel Co.

"Effect of Boron and Kind of Boron Addition Upon Properties of Steel," by R. A. Grange and W. B. Seens, members of staff, U. S. Steel Corp., Research Laboratory, and W. S. Holt and T. M. Garvey, Metallurgical Department, Carnegie-Illinois Steel Corp.

"Characteristics and Properties of Cast Low-Chromium-Molybdenum Steels," by N. A. Ziegler, research metallurgist, W. L. Meinhart, assistant research metallurgist, and J. R. Goldsmith, metallurgical engineer in charge of research foundry, Crane Co.

FRED H. HAGGERSON
President, Union Carbide & Carbon Corp. Winner, ASM Medal for Advancement of Research, 1949

A. G. BISSELL
Bureau of Ships, Navy Department. Winner AWS Samuel Wylie Miller Memorial Medal, 1949

"Iron-Manganese and Iron-Manganese-Nickel Alloys," by Irvin R. Kramer, head, mechanics and materials branch, Office of Naval Research, Stewart L. Toleman, metallurgist, Naval Research Laboratory, and Walter T. Haswell, metallurgist, Latrobe Steel Co.

"Metallurgical Factors Affecting the Magnetic and Mechanical Properties of Iron-Cobalt Alloys," by J. K. Stanley, Magnetic Dept., Westinghouse Electric Corp.

Tuesday, Oct. 18—9:30 a.m.

Oxidation Session

Joint Chairmen

M. G. FONTANA, Ohio State University
C. A. ZAPFFE, Consultant

"High Temperature Oxidation of Manganese," by R. S. Gurnick, research engineer, Thompson Products Inc., and W. M. Baldwin Jr., research professor, Case Institute of Technology

"Determination of Oxygen in Metals by the Vacuum Fusion Method," by R. K. McGeary, J. K. Stanley, and T. D. Yensen, Westinghouse Research Laboratories

"Methods of Determining Vapor Pressure of Metals," by Rudolph Speiser, associate supervisor, and H. L. Johnston, director, Cryogenic Laboratory, Ohio State University

"An X-Ray Study of the Scale Formed on Iron Between 400 and 700° C," by O. A. Tesche, Government Metallurgical Laboratory, University of the Witwatersrand, Johannesburg, S. Africa

Tuesday, Oct. 18—9:30 a.m.

Quenching Session

Joint Chairmen

M. COHEN, Massachusetts Institute of Technology
E. S. ROWLAND, Timken Roller Bearing Co.

"A Quench Cracking Susceptibility Test for Hollow Cylinder," by Cyril Wells, member of staff, Metals Research Laboratory, Carnegie Institute of Technology, C. F. Sawyer, metallurgist, Vanadium-Alloys Steel Co., I. Broverman, Los Alamos Scientific Laboratory, and R. F. Mehl, director, Metals Research Laboratory, Carnegie Institute of Technology

"An Engineering Analysis of the Problem of Quench Cracking in Steel," by Cyril Wells, member of staff, Metals Research Laboratory, Carnegie Institute of Technology, and J. W. Spretnak, associate professor of metallurgy, Ohio State University

"Pre-Bore Quench for Hollow Cylinders," by J. W. Spretnak, associate professor of metallurgy, Ohio State University, and C. C. Busby, Metals Research Laboratory, Carnegie Institute of Technology

"Statistical Methods for Evaluating the Quality of Certain Wrought Steel Products," by Edwin G. Olds, associate professor, Mathematics Department and Cyril Wells, member of staff, Metals Research Laboratory, Carnegie Institute of Technology

Tuesday, Oct. 18—2:00 p.m.

High Temperature Metallurgy Session

Joint Chairmen

H. C. CROSS, Battelle Memorial Institute
J. J. KANTER, Crane Co.

"Influence of Strain Rate and Temperature on Creep of Cold-Drawn Ingot Iron," by W. D. Jenkins and T. G. Digges, chief, thermal metallurgy, National Bureau of Standards

"Stability of AISI Alloy Steels at Elevated Temperatures," by A. B. Wilder, chief metallurgist, National Tube Co., and J. O. Light, chief metallurgist, Lorain Works, National Tube Co.

"On Extrapolation of Short Time Stress Rupture Data," by N. J. Grant, associate professor of metallurgy, and Albert G. Bucklin, research assistant in metallurgy, Massachusetts Institute of Technology

"The Tungsten-Iridium Thermocouple for Very High Temperatures," by Walter C. Troy, supervisor, and Gary Steven, research metallurgist, Metals Department, Armour Research Foundation

Wednesday, Oct. 19—10:00 a.m.

ASM Annual Meeting

Edward deMille Campbell Memorial Lecture by E. H. Dix, Jr., assistant director of research, Aluminum Co. of America

Wednesday, Oct. 19—2:00 p.m.

Transformation in Steels Session and Temper Brittleness Session

Joint Chairmen

G. A. TIMMONS, Climax Molybdenum Co.
A. R. TROIANO, University of Notre Dame

"Measurement of Retained Austenite in Carbon Steels," by B. L. Averbach, assistant professor, L. S. Castleman, research assistant, and M. Cohen, professor of metallurgy, Massachusetts Institute of Technology

"Effect of Alloying Elements on the Transformation Characteristics of Induction Heated Steels," by J. F. Libsch, assistant professor of metallurgy, and W. P. Chuang and W. J. Murphy, graduate students, Lehigh University

"Influence of Composition on Temper Brittleness in Alloy Steels," by A. P. Taber, colonel, Ordnance Department, J. F. Thorlin, lt. colonel, Ordnance Department, and J. F. Wallace, metallurgist, Watertown Arsenal

"Isothermal Temper Embrittlement," by L. D. Jaffe and D. C. Buffum, Watertown Arsenal Laboratory

CHARLES R. COX
President, Carnegie-Illinois Steel Corp., Principal Speaker at Annual Banquet, American Society for Metals

E. H. DIX Jr.
Aluminum Research Laboratories, Aluminum Co. of America. To deliver Edward deMille Campbell Lecture

Thursday, Oct. 20—9:30 a.m.

Stainless Steel Session

Joint Chairmen

RUSSELL FRANKS, Electro Metallurgical Co.
V. N. KRIVOBOK, International Nickel Co.

"A Bar-Bend Test and Its Application to Stainless Steel," by C. A. Zapffe, R. L. Phebus and F. K. Landgraf, consultants

"Creep and Rupture of Several Chromium-Nickel Austenitic Stainless Steels," by G. V. Smith, E. J. Dulis and E. G. Houston, Research Laboratory, U. S. Steel Corp.

"Effect of Sigma Phase on Short Time High Temperature Properties of 25 Chromium—20 Nickel Stainless Steel," by Glen J. Guarnieri, James Miller and Frank J. Vawter, Cornell Aeronautical Laboratory Inc.

"Stress Corrosion of a Stainless Steel Compressor Through Unbalanced Dynamic Loading and Exposure to a Mildly Corrosive Solution," by Frank W. Davis, chief metallurgist, E. B. Badger & Sons Co.

Thursday, Oct. 20—2:00 p.m.

Mechanical Metallurgy Session

Joint Chairmen

M. GENSAMER, Carnegie-Illinois Steel Corp.
I. R. KRAMER, Office of Naval Research

"New Equipment for Damping Capacity, Elasticity, and Fatigue Testing and Correlation of These Properties for Mild Steel," by B. J. Lazan, professor and head, Department of Materials Engineering, Syracuse University

"Effect of Steady Stress on Fatigue Behavior of Aluminum," by J. A. Sauer, head, Department of Engineering Mechanics, Pennsylvania State College and D. C. Lemmon, General Electric Co.

"New Criteria for Predicting the Press Performance of Deep Drawing Sheets," by W. T. Lankford, S. C. Snyder and J. A. Bauscher, Research and Development Division, Carnegie-Illinois Steel Corp.

"Fractographic Study of Deformation and Cleavage in Ingot Iron," by C. A. Zapffe and C. O. Worden, consultants

Friday, Oct. 21—9:30 a.m.

Atomic Energy Metallurgy Session

"Metallurgy of Beryllium," by A. R. Kaufmann, Massachusetts Institute of Technology

"Effects of Radiation on Materials," by Sidney Siegel, Atomic Power Division, Westinghouse Electric Co., and Douglas Billington, Naval Research Laboratory

Some Aspects of Uranium Metallurgy: "Uranium Crystal Structure," by C. W. Tucker, Knolls Atomic Power Lab.; "Elastic Constants of Uranium," by Henry L. Laquer, William E. McGee and Myra F. Kilpatrick, Los Alamos Scientific Lab.; "Uranium-Manganese and Uranium-Copper Alloy Systems," by H. A. Wilhelm and O. N. Carlson, Ames Lab., U. S. Atomic Energy Commission; "Thorium-Carbon System," by H. A. Wilhelm and Primo Chiotti, Ames Lab.

Friday, Oct. 21—2:00 p.m.

Nonferrous Session

Joint Chairmen

W. M. BALDWIN, JR., Case Institute of Technology
K. R. VAN HORN, Aluminum Co. of America

"Fabrication and Mechanical Properties of Ductile Zirconium," by E. T. Hayes, physical metallurgist, E. D. Dilling, metallurgist, and A. H. Roberson, metallurgist, Bureau of Mines, Northwest Electrodevelopment Laboratory

"A Study of Arc-Melted Molybdenum-Rich Chromium-Molybdenum Alloys," by Harold D. Kessler, research metallurgist, and M. Hansen, Armour Research Foundation

"Effects of Quenching Rate and Quench-Aging on the Tensile Properties of Aluminum Alloy 61S," by R. C. Lemon, research metallurgist, and H. Y. Hunsicker, assistant chief, Cleveland Research Division, Aluminum Co. of America

"Preparation of Metal Single Crystals," by A. N. Holden, Research Laboratory, General Electric Co.

American Welding Society

PROGRAM

All Sessions at Hotel Cleveland, Oct. 17 to 21

Monday Morning, Oct. 17

Structural Design

"Design and Construction of a Modern Welded Deck Girder Highway Bridge," by Ned L. Ashton, State University of Iowa

"Economical Design of Welded Buildings," by Robert E. Robertson Jr., Saxe, Williar & Robertson, engineers and consultants

"Proposed Design of Welded Rigid Frames for New York Subways," by Martin P. Korn, consulting engineer

"A Strain Gage Test and Analysis of an Eighty-Foot H-Section Welded Truss," by A. Waidelich, Austin Co.

Pressure Vessels

"Importance of Design in Construction of Tanks and Pressure Vessels," by Walter Samans, chairman, Pressure Vessel Research Committee

"Trends in Fabrication by Welding," by S. V. Williams, Struthers-Wells Corp.

"Inert-Gas-Shielded Arc-Welding Aluminum Pressure Vessels," by A. J. Hopper, Welding Engineers Inc.

"Notch Sensitivity of Mild Steel Plates," by A. B. Bagsar, Sun Oil Co.

Hard Facing and Flame Hardening

"Automatic Electric Hard Facing," by Turner G. Brashear Jr., Leader Welding & Mfg. Co.

"Hot Hardness of Hard-Facing Alloys," by Howard S. Avery, American Brake Shoe Co.

"Hard-Facing Applications in the Steel Industry," by J. J. Barry, Air Reduction Sales Co.

"Flame Hardening of Large Diameter Rounds," by S. Smith, Air Reduction Sales Co.

Monday Afternoon, Oct. 17

Nonferrous Metals

"Arc Welding of Molybdenum," by I. S. Goodman, Westinghouse Electric Corp.

"Welding of High-Nickel Alloys to Other Metals," by G. R. Pease and H. B. Bott, International Nickel Co.

"Seam Welding Monel Metal to Steel," by Ernest F. Nippes, Allan R. Pfluger and Gerald M. Slaughter, Rensselaer Polytechnic Institute

Education

"Welding in Engineering Education," by R. S. Green, Ohio State University

"Formal Training of Welding Personnel," by Allen C. Tyler, acting dean, LeTourneau Technical Institute

"Continuation of Study of Welding and Welding Processes," by Frank W. Scott, Marquette Mfg. Co. Inc.

Research

"The Statistical Part in Welding Investigations," by B. B. Day, statistician, director's staff, U. S. Naval Engrg. Exp. Station

"Brittle Failure and Size Effect in a Mild Steel," by K. J. Stodden and E. P. Klier, Pennsylvania State College

"Weld-Peening Investigations," by J. Lyell Wilson, American Bureau of Shipping

Monday Afternoon, Oct. 17

Educational Lecture Series

"Designing for Welding," by H. W. Pierce, New York Shipbuilding Corp.

Monday Evening, Oct. 17

1949 Adams Lecture

"Advantages and Disadvantages of Electric Welding as a Means of Fabricating Steel Structures," by W. M. Wilson, University of Illinois

Schedule of
ROUND TABLE-FORUM DISCUSSIONS
At Cleveland Public Auditorium, Oct. 17 to 21

Monday, Oct. 17—2:00 p.m.

"Economy-in-Production Through Better Cleaning and Finishing Methods," Subdivisions: Metal Cleaning—Processes and Applications, Equipment (Vapor, Dip), Abrasion Cleaning (Tumbling). Metal Finishing—Metal Plating, Chemical and Organic Coatings, Painting

Monday, Oct. 17—8:00 p.m.

"Economy-in-Production Through Improved Press Shop Operation," Subdivisions: Dies, Die Materials, Die Maintenance, Progressive or Multi-Station Operations, Operations on Multi-Slide Headers, Spinning, Stretch Forming, More Adaptable Sheet and Strip, Lubricant

Tuesday, Oct. 18—2:00 p.m.

"Economy-in-Production Through Improved Welding Techniques and Equipment," Subdivisions: Arc Welding, Submerged Arc Welding, Oxy-Acetylene Welding, Spot Welding—Protected Arc Welding, Weldability of Materials, Resistance Welding

Tuesday, Oct. 18—8:00 p.m.

"Economy-in-Production Through Improved Heat Treatment Operations," Subdivisions: Commercial Heat Treating, Induction Hardening, Flame Hardening, General Plant Layouts, Atmospheres, Mass Production Methods, Salt Baths—Tools Carburizing—Steel Selection

Wednesday, Oct. 19—2:00 p.m.

"Economy-in-Production Through the Use of Tailor-Made Alloys or More Adaptable Mill Products," Subdivisions: Right Steel for the Purpose, Light Metals (Aluminum or Magnesium), Nonferrous Metal (Brass or Bronze), Shapes: Extrusions, Tubing, Wire, Bars, Clad, Galvanized, Tinned, Aluminum-Coated

Wednesday, Oct. 19—8:00 p.m.

"Economy-in-Production Through the Use of More Precise Castings or Formed Shapes," Subdivisions: Sand Castings of Unusual Precision, Die Castings, Precision Castings, Extrusion, Drop Forging, Coining, and Heading, Ceramic Molds, Powder Metallurgical Methods

Thursday, Oct. 20—2:00 p.m.

"Economy-in-Production Through Improved Metallurgy in Machine Shop Operations," Subdivisions: Toolsteels and Carbides, Selection of Steels, Cold Worked, Sulphurized, Heat Treating for Machinability, Machinable Brasses and Light Metals, Proper Use of Cutting Oils and Other Auxiliaries

Friday, Oct. 21—2:00 p.m.

"Economy-in-Production by the Use of Brazing, Soldering and Welding for Sub-Assemblies," Subdivisions: Silver Soldering, Brazing of Aluminum, Low Temperature Soldering, Welding, Copper (Hydrogen) Brazing of Steel and Stainless

Tuesday Morning, Oct. 18

Symposium on Ship Structure Research

ıtroduction: "Work of Ship Structure Committee," by Rear Adm. Ellis Reedhill, U.S.C.G. chairman, Ship Structure Committee

Factors Influencing the Tensile Behavior of Notched Flat Plate Specimens," by Prof. S. T. Carpenter and Capt. W. P. Roop, U.S.N. (Ret.), Swarthmore College

Correlation of Test Results," by C. F. Tipper, University of Cambridge, England

Tests of Slotted Steel Plates," by E. M. MacCutcheon, C. L. Pittiglio, David Taylor Model Basin, U.S.N., and R. H. Raring, National Research Council

Further Study of the Navy Tear Test," by Noah Kahn and Emil Imbembo, New York Naval Shipyard

Resistance Welding

Material Consumption Rates and Flashing Characteristics," by William N. Platte, Westinghouse Electric Corp.

Factors Affecting the Quality of Production Flash Welding," by E. Sirabian, Arnold, Schwinn & Co.

The Homopolar Generator Stored-Energy System for Resistance Welding," by Thomas J. Crawford, Progressive Welder Co.

Circuit Analysis of Frequency Changer Welders," by W. K. Boice, General Electric Co.

Machinery Welding

Weldment Design and Engineering Practice," by Anthony K. Pandjiris, Pandjiris Weldment Co.

Welding of Alloy Steel Shovel Buckets," by E. R. McClung, Lukenweld Inc.

Lowering Cost of Welded Construction," by Omer Blodgett, Lincoln Electric Co.

Aluminum Bronze Electrodes," by J. A. Cunningham, J. A. Cunningham Equipment Inc.

Tuesday Afternoon, Oct. 18

Symposium on Ship Structure Research

Distribution of Relative Ductility in Steel Weldments," by L. J. Klinger and L. J. Ebert, Case Institute of Technology

"Bend and Tensile Specimens Used as Indices of Performance and Weldability," by C. B. Voldrich and P. J. Rieppel, Battelle Memorial Institute

"Effect of Cyclic Stress on Impact Transition Curve of Ship Steels," by Prof. J. M. Lessells and H. E. Jacques Massachusetts Institute of Technology

"Axial Tension Impact Tests of Structural Steels," by W. H. Bruckner and N. M. Newmark, University of Illinois

Resistance Welding

"Spotweld Consistency Studies," by Julius Heuschkel and H. C. Bitzer, Westinghouse Research Laboratories

"Spot Welding Heavy Gage Structural Steel," by Ernest F. Nippes and R. F. Underhill Jr., Rensselaer Polytechnic Institute

"Slope Control and Its Effect on Spot and Projection Welding," by I. W. Johnson, General Electric Co.

Miscellaneous

"Welding of Zinc-Base Die Castings," by Roland H. Ogden, Alladin Rod & Flux Mfg. Co.

"Silver Alloy Brazing Stainless Steel," by C. H. Chatfield and A. W. Swift, Handy & Harman

"Magnaflux Inspection of Welded Storage Tanks," by F. A. Upson, Standard Oil Co. (Indiana)

"High Energy Loading Method of Testing Steel Plate and Weldments," by G. S. Mikhalapov, Metallurgical Research and Development Co., Inc.

Tuesday Afternoon, Oct. 18

Educational Lecture Series

"Designing for Welding," by H. W. Pierce, New York Shipbuilding Corp.

Tuesday Evening, Oct. 18

President's Reception

Wednesday Morning, Oct. 19

Apparatus

"Design Features of a Welding Generator with Controlled Reactance," by J. M. Tyrner, Air Reduction Sales

Co. and O. Kobel, G. D. Peters & Co. of Canada Ltd.

"Measurement of Flux Densities in Steels for Magnetic Particle Inspection," by T. E. Hamill, Naval Gun Factory

"Economical Arc Welding," by S. Oestreicher, Harnischfeger Corp.

Resistance Welding

"Fatigue Tests of Spot-Welded Mild Steel and Stainless Steel Sheets," by Prof. Georges Welter, Ecole Polytechnique, Montreal, Canada

"Spot Welding Galvanized Steel," by M. L. Begeman, Millard L. Hipple and L. Cullum Jr., University of Texas

"Electrical Resistance Offered by Nonuniform Current Flow," by W. B. Kouwenhoven and William T. Sackett Jr., School of Engineering, Johns Hopkins University

"Design and Application of Portable Resistance Welding Tools," by C. H. Davis Jr., Budd Co.

Aluminum

"The Economy of Shielded Arc Welding of Aluminum," by Fritz Albrecht, Glenn L. Martin Co.

"Shear Strength Consistency of Spot Welds in Alclad 24 S-T3," by J. C. Barrett, Glenn L. Martin Co.

"Heliarc Welding of Aluminum Alloys," by F. H. Stevenson, Modern Metal Spinning & Mfg. Co.

Wednesday Afternoon, Oct. 19

Educational Lecture Series

"Design for Welding," by H. W. Pierce, New York Shipbuilding Corp.

Wednesday Afternoon, Oct. 19

Business Meeting

Board of Directors Meeting

Wednesday Evening, Oct. 19

Section Officers Conference

University Conference

Thursday Morning, Oct. 20

Arcs and Electrodes

"Arc Welding Metal Transfer Analyzer," by R. C. McMaster, D. C. Martin and A. Leatherman, Battelle Memorial Institute

"Heat Effects in Anode Spots of High-Current Arc," by Dr. T. Benjamin Jones, Johns Hopkins University

"Application of Mild Steel Welding Electrodes, by F. [illegible] Strate, Air Reduction Sales Co. and R. I. Strough Arcrods Corp.

"Energy Distribution in Electric Welding," by Clarenc E. Jackson and A. E. Shrubsall, Union Carbide an Carbon Research Laboratories

Railroad

"Evolution of the Welded Freight Car," by L. E. Gran Chicago, Milwaukee, St. Paul & Pacific Railroad Co.

"Oxyacetylene Pressure-Welded Rail Saves Maintenanc Costs," by Lem Adams, Oxweld Railroad Servic Co.

"Arc Welding in Railroad Shops," by E. DiLiberti, A Reduction Sales Co.

"Inert Gas Welding in Railroad Repair and Rehabilita tion," by H. E. Gannett, Chicago, Burlington Quincy Railroad

Weldability

"Strain Aging in Welding Low-Carbon Structural Steel by W. H. Bruckner and S. W. Sandberg, Universit of Illinois

"The High-Frequency Notch Bend Test," by Bela Rona U.S. Naval Engineering Experiment Station

"Studies Concerning the Strain-Aging of Arc Welds i Mild Steel," by A. E. Flanigan, University of Cal fornia, Los Angeles

"Synthetically Heat Treated Specimens for Weldability by Ernest F. Nippes and Warren Savage, Renssela Polytechnic Institute

Thursday Evening, Oct. 20

Symposium—"For Economy in Production—Weld"

Friday Morning, Oct. 21

Inert Gas Welding

"Heliarc Welding in the Automotive Industry," by F. Pilia and R. H. Bennewitz, Linde Air Products Co.

"Aircomatic Welding," by A. Muller, G. J. Gibson and H. Roper, Air Reduction Sales Co.

American Society for Metals
EDUCATIONAL LECTURES
At Public Auditorium, Oct. 17, 18 and 19

MACHINING—THEORY AND PRACTICE

Monday, Oct. 17—4:15 p.m.

"Symposium Keynote", by Hans Ernst, director of research, Cincinnati Milling Machine Co.

"Metal Cutting Research," by M. E. Merchant, physicist, Cincinnati Milling Machine Co.

"Cutting Fluid Theory," by Milton Shaw, assistant professor of mechanical engineering, Massachusetts Institute of Technology

Monday, Oct. 17—8:00 p.m.

"Materials and Machinability," by F. W. Boulger, supervising metallurgist, Battelle Memorial Institute

"Metallurgy and Machinability of Steels," by J. D. Armour, chief metallurgist, Union Drawn Steel Division, Republic Steel Co.

"Tool Steels," by George A. Roberts, chief metallurgist, Vanadium-Alloys Steel Co.

Tuesday, Oct. 18—4:15 p.m.

"Cemented Carbide Tool Materials," by J. C. Redmond, Kennametal Inc.

"Heat in Metal Cutting," by A. O. Schmidt, research engineer, Kearney & Trecker

"Evaluation of Machinability," by Michael Field and N. Zlatin, Metcut Research Associates

Tuesday, Oct. 18—8:00 p.m.

"Tool Life Testing," by O. W. Boston, chairman, Department of Metal Processing, University of Michigan

"Some Metallurgical Aspects of Grinding," by L. P. Tarasov, research metallurgist, Norton Co.

"Economics of Machining," by W. W. Gilbert, assistant professor, University of Michigan

"Development of the Macrostructure of Metals by Machining," by L. M. Clarebrough and G. J. Ogilvie, University of Melbourne

STRESS CORROSION IN METALS

Wednesday, Oct. 19—4:15 p.m.

"Generalized Theory of Stress Corrosion," by J. T. Waber, staff metallurgist, University of California, Los Alamos Scientific Laboratory

Wednesday, Oct. 19—5:15 p.m.

"Corrosion Fatigue and Stress Corrosion as Encountered in a Practical Way in the Petroleum Industry," by Fred Prange, Phillips Petroleum Co.

Wednesday, Oct. 19—8:00 p.m.

"Stress Corrosion Phenomenon Encountered with Stainless Steels and Other High Alloy Materials," by James J. Heger, Carnegie-Illinois Steel Corp.

Inert Gas-Shielded Metal Arc Welding Process," by H. O. Jones, Air Reduction Sales Co.

Applications for Helium in Inert Arc Welding," by M. J. Conway, General Electric Co.

Stainless Steel

Corrosion Resistance of Molybdenum Bearing Stainless Steel Weld Metals," by R. D. Thomas Jr., and Anton L. Schaeffler, Arcos Corp.

Problems Associated with Welding of Stainless Clad Steel," by Perry C. Arnold, Chicago Bridge & Iron Co.

Resistance Welding Stainless Steel Truck-Trailer Body Components," by Byron Gates, Budd Co.

Stainless Steel Fabrication by Inert-Gas-Shielded Arc Welding," by Charles D. Bonifield, Globe Co.

Gas Cutting

New Developments in Oxyacetylene Cutting Machines," by W. Begerow and A. H. Yoch, Air Reduction Sales Co.

Steel Warehouse Shape Cutting with Electronic Tracers," by William O. Springer, Jos. T. Ryerson & Son Inc.

Flame Cutting," by James T. Lewis, Lewis Welding & Engineering Corp.

Powder Cutting and Scarfing Process," by C. W. Powell, Republic Steel Corp.

DUCATIONAL LECTURES—American Welding Society
ct. 17, 18 and 19—4:30-6:00 p.m., Public Auditorium

A series of three lectures on WELDING DESIGN FUNAMENTALS will be given by H. W. Pierce, assistant president, New York Shipbuilding Corp., Camden, N. J.

1. *Weld and Joint Types,* and their application in design with respect to strength and economy.
2. *Shrinkage and Distortion.* A discussion of the methods to minimize the two principal difficulties in welding from the design point of view.
3. *Codes, Procedures, and Qualification Requirements* as they affect the designer.

PROGRAM

nstitute of Metals Branch

ll Sessions in Allerton Hotel, Oct. 17 to 19

Monday, Oct. 17—9:00 a.m.

Precipitation and Aging

Precipitation Phenomena in the Solid Solution of Nitrogen and Carbon in Alpha Iron below the Eutectoid Temperature," by L. J. Dijkstra, University of Chicago

Yielding and Strain-Aging of Nitrided Single Crystals of Iron," by H. Schwartzbart and J. R. Low Jr., Penn State College

Effect of Quenching on Age Hardening of Two Aluminum Alloys," by R. D. Barer and M. B. Bever, Massachusetts Institute of Technology

Size Effects in Quenching High Purity Precipitation-Hardenable Alloys," by W. L. Finlay, Remington Arms Co. Inc.

Fracture and Strain Phenomena

A Metallographic Description of Fracture in Impact Specimens of Structural Steel," by M. Baeyertz, W. F. Craig Jr., and E. S. Bumps, Armour Research Foundation

Effect of Ferrite Grain Size on Notch Toughness," by J. M. Hodge, R. D. Manning and H. M. Reichhold, Carnegie-Illinois Steel Corp.

Investigation of Temper Brittleness in Low Alloy Steels," by S. A. Herres and A. R. Elsea, Battelle Memorial Institute

Effects of Molybdenum and Commercial Ranges of Phosphorous on the Toughness of 0.40% Carbon Chromium Steels," by M. Baeyertz, W. F. Craig Jr. and J. P. Sheehan, Armour Research Foundation

Recrystallization

"Secondary Recrystallization in Copper," by M. L. Kronberg and F. H. Wilson, American Brass Co.

"Recovery and Recrystallization in Brass," by B. L. Averbach, Massachusetts Institute of Technology

"Recrystallization Texture and Coarsening Texture in High Purity Aluminum," by P. A. Beck and Hsun Hu, University of Notre Dame

"Recrystallization and Microstructure of Aluminum Killed Deep Drawing Steel," by R. L. Rickett, U.S. Steel Corp.; S. H. Kalin, Carnegie-Illinois Steel Corp. and J. T. MacKenzie Jr., U.S. Steel Export Co.

Monday, Oct. 17—2:00 p.m.

Equilibrium Diagrams

"The Beryllium-Iron System," by R. J. Teitel, Brookhaven National Laboratories and M. Cohen, Massachusetts Institute of Technology

"The Ternary System, Copper-Manganese-Zinc," by T. R. Graham, J. R. Long, C. E. Armantrout and A. H. Roberson, U. S. Bureau of Mines

"Solubility of Titanium in Liquid Magnesium," by K. T. Aust and L. M. Pidgeon, University of Toronto

"Liquid Solubility of Manganese in a Magnesium-Aluminum-Tin Alloy," by B. J. Nelson and G. F. Sager, Aluminum Co. of America

Fracture and Strain Phenomena

"Discontinuous Crack Propagation—Further Studies," by L. D. Jaffe, E. L. Reed and H. C. Mann, Watertown Arsenal Laboratories

"Stress and Strain States in Elliptical Bulges," by C. C. Chow, A. W. Dana and G. Sachs, Case Institute of Technology

"The Comparative Creep Properties of Several Types of Commercial Coppers," by A. D. Schwope, K. F. Smith and L. R. Jackson, Battelle Memorial Institute

"The Active Slip Systems in the Simple Axial Extension of a Crystalline Alpha Brass," by R. C. Maddin, C. H. Mathewson, W. R. Hibbard Jr., Yale University

Electrical Properties of Alloys

"P-Type and N-Type Silicon and the Formation of the Photovoltaic Barrier in Silicon Ingots," by J. H. Scaff, H. C. Theurer and E. E. Schumacher, Bell Telephone Laboratories

"Microstructure of Silicon Ingots," by W. G. Pfann and J. H. Scaff, Bell Telephone Laboratories

"Electrical Properties of the Intermetallic Compounds Mg_2Sn and Mg_2Pb," by W. D. Robertson, University of Chicago and H. H. Uhlig, Massachusetts Institute of Technology

"Ferromagnetic Alloys in the Systems Copper-Manganese-Indium and Copper-Manganese-Gallium," by F. A. Hames and D. S. Eppelsheimer, Missouri School of Mines and Metallurgy

Tuesday, Oct. 18—9:00 a.m.

Transformations

"Kinetics of Austenite Decomposition—Ferrite Nucleated Products," by J. C. Fisher, J. H. Holomon and D. Turnbull, General Electric Co.

"Free Energy Changes Accompanying the Martensite Transformation in Steels," by J. C. Fisher, General Electric Co.

"The Hardenability Effect of Molybdenum," by J. M. Hodge, J. L. Giove and R. G. Storm, Carnegie-Illinois Steel Corp.

Fracture and Strain Phenomena

"Simultaneous Aging and Deformation in Metals," by J. D. Lubahn, General Electric Co.

"Transverse Bending of Single Crystals of Aluminum," by M. K. Yen, New York University and W. R. Hibbard Jr., Yale University

"Stages in the Deformation of Monel as Shown by Polarized Light," by D. H. Woodard, National Bureau of Standards

"Influence of Temperature on Stress-Strain Energy Relationship for Copper and Nickel-Copper Alloys," by D. J. McAdams Jr., National Bureau of Standards

Surface Orientation
Phase Relationships

"Surface Orientation and Rolling of Magnesium Sheets," by R. L. Dietrich, Dow Chemical Co.

"Oriented Arrangements of Thin Aluminum Films on Ionic Substrates," by Thor Rhodin Jr., University of Chicago

"Kinetics of the Reactions of Zirconium with O_2, N_2 and H_2," by E. A. Gulbransen and K. Andrew, Westinghouse Research Laboratory

"Kinetics af the Reactions of Titanium with O_2, N_2 and H_2," by E. A. Gulbransen and K. Andrew, Westinghouse Research Laboratory

Tuesday, Oct. 18—2:00 p.m.

Transformations

"Stable Transformation Nuclei in Solids," by J. N. Hobstetter, Harvard University.

"The Transformation in B-CuAl Alloys," by E. P. Klier, Penn State College and S. M. Grymko, Battelle Memorial Institute

"Transformation of Gamma Manganese to Alpha Manganese," by E. V. Potter, H. C. Lukens and R. W. Huber, U.S. Bureau of Mines

Structure and Identity of Materials

"The Rapid Determination of Orientation of Cubic Crystals," by C. G. Dunn and W. W. Martin, General Electric Co.

"The Crystal Structure of Ni_4W," by E. Epremian and D. Harker, General Electric Co.

"Structure of Diborides of Titanium, Zirconium, Columbium, Tantalum and Vanadium," by J. T. Norton, Massachusetts Institute of Technology, H. Blumenthal and S. J. Sideband, American Electro Metallurgical Corp.

"Isolation of Carbides from High Speed Steels," by D. J. Blickwede and M. Cohen, Massachusetts Institute of Technology

Diffusion—Grain Boundries

"The Diffusion and Solubility of Carbon in Alpha Iron," by J. K. Stanley, Westinghouse Electric Corp.

"Analysis of Interstitial Diffusion Using Activity Methods," by A. G. Guy, North Carolina State College

"Study of Grain Boundaries with the Electron Microscope," by J. F. Radavish, Purdue University

"Studies of Interface Energies in Some Aluminum and Copper Alloys," by K. K. Ikeuye and C. S. Smith, University of Chicago

Wednesday, Oct. 19—2:00 p.m.

Annealing Twins—Kink Bands

"The Origin of Annealing Twins in Brass," by R. C. Maddin, C. H. Mathewson and W. R. Hibbard Jr., Yale University

"Annealing Twins in Copper and 70-30 Alpha Brass," by W. R. Hibbard Jr., Jon Chao Liu and S. F. Reiter, Yale University

"Structure and Nature of Kink Bands in Zinc," by J. B. Hess and C. S. Barrett, University of Chicago

"Vapor Pressure of Zinc and Cadmium Over Some of Their Silver Alloys," by C. E. Birchenall and C. H. Cheng, Carnegie Institute of Technology

Powder Metallurgy

"A Method of Examination of Sections of Fine Metal Powder Particles with Electron Microscope," by (Miss) Laurence Delisle, Sylvania Electric Products Inc.

"The Pore Size of Hydrogen Reduced Tungsten Powder," by Bernard Kopelman and C. C. Gregg, Sylvania Electric Products Inc.

"Determination of Boundary Stresses During the Compression of Cylindrical Powder Compacts," by M. E. Shank and John Wulff, Massachusetts Institute of Technology

"A Dilatometric Study of the Sintering of Metal Powder Compacts," by Pol Duwez and Howard Martens, California Institute of Technology

"Electrical Resistivity, Measurements on Iron-Silicon Compacts Prepared by the Powder Metallurgy Procedure," by F. W. Glaser, American Electro Metallurgical Corp.

Titanium—Beryllium

"Lattice Parameters of High Purity Alpha Titanium and Effect of Oxygen and Nitrogen on Them," by H. T. Clark Jr., Remington Arms Co. Inc.

"Effect of Oxygen, Nitrogen and Hydrogen on Iodide Refined Titanium," by R. I. Jaffee and I. E. Campbell Battelle Memorial Institute

"Preparation and Casting of Beryllium Melts," by J. K. Kura, J. A. Jackson, M. C. Udy and L. W. Eastwood Battelle Memorial Institute

"Metallographic Examination of Beryllium Alloys," by M. C. Udy, G. K. Manning and L. W. Eastwood Battelle Memorial Institute

SOCIETY FOR NONDESTRUCTIVE TESTING ★ SNT

PROGRAM

All Sessions at Hotel Statler, Oct. 19 and 20

Wednesday, Oct. 19—9:30 a.m.

Non-Destructive Testing Techniques and Equipment

"Radium, Tantalium and Cobalt as Sources of Radiation for Industrial Radiography," by G. H. Tenney, Los Alamos Scientific Laboratory

"Sonic Inspection by the Immersion Technique," by Donald Erdman, Triplett & Barton Inc.

"High Voltage X-Ray Equipment and Technique," by E. E. Charlton, General Electric Research Laboratory

"Nondestructive Hardness Testing," by D. L. Palmer Scintilla Magneto Co.

"Xeroradiography—A Basic Development in X-Ray Nondestructive Testing", by Robert C. McMaster, Battelle Memorial Institute

Wednesday, Oct. 19—2:00 p.m.

Industrial Applications of Non-Destructive Testing

"Current Applications of Magnetic Analysis Inspection," by V. L. Spoley, Magnetic Analysis Corp.

"Plastics Inspection by Special Low Voltage X-Ray Equipment," by D. T. O'Connor, Naval Ordnance Laboratory

"Testing of Jet Engine Parts," by Tom Piper, Northrop Aircraft Company

"Simulated Service Testing for Establishing Non-Destructive Testing Standards," by L. W. Ball, Naval Ordnance Laboratory

Thursday, Oct. 20—9:30 a.m.

Non-Destructive Testing in Industrial Management

"Training and Qualifications for a Career in a Commercial X-Ray and Non-Destructive Testing Laboratory," by Justin Schneeman, X-Ray Products Corp

"Career Possibilities for Non-Destructive Specialists in a Large Metallurgical Company," by Kent Van Horn, Aluminum Co. of America

"Peacetime Preparation for Quality Control During Industrial Mobilization," by W. R. Pabst, Quality Control Division, Navy Bureau of Ordnance

Thursday, Oct. 20—2:00 p.m.

Lester Lecture

"Magnetic Inspection Methods," by Launcelot A. Dansen General Motors Corp.; Chairman William F. Alderson; Ninth Annual business meeting

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NATIONAL METAL SHOW

PRODUCTS on EXHIBIT

AND PERSONNEL IN ATTENDANCE

Products preceded by an asterisk (*) are being exhibited for the first time.

Acme Mfg. Co. 826

Detroit, Mich.

To Exhibit—Straight line automatic polishing and buffing machine with set of universal camming type fixtures adaptable for holding numerous articles

Representatives—Glen A. Carlson, George R. Carlson, John G. Hackert

Air-Flo Compressor Co. 1750

Akron, O.

To Exhibit—Air-Flo compressors, 24 principal parts of which build a line of 108 models of 1, 2, 3, 4 or 6-cylinder pumps

Representatives—Raymond F. Kagy, James D. Canavan, William K. Jarrett, salesmen; William V. Fischer, sales manager; L. L. Happoldt, treasurer

Ajax Electric Co. 1901

Philadelphia, Pa.

To Exhibit—Ajax Hultgren electric salt bath furnace installation pictured in color, over 200 sample products displayed to show advantages of salt bath processing

Representatives—G. H. Clamer, president; William Adam Jr., vice president; L. B. Rosseau, assistant vice president; H. W. Kerst, project engineer; Q. D. Mehrkam, metallurgist; and E. E. Bolds, Cleveland, A. A. Anderson, Cleveland, J. E. Bullock, Detroit, O. M. Haseltine, Chicago, R. D. Hawkins, Indianapolis, John S. Gibson, Pittsburgh, sales representatives

Allen Mfg. Co. 1615

Hartford, Conn.

To Exhibit—*Hex socket pipe plugs with cold drawn heads, pressure-formed and threaded

Representatives—Willis D. Horner, sales manager; George Ulring, William E. Hensel, George Newton, field sales representatives

Allis-Chalmers Mfg. Co. 1215

Milwaukee, Wisc.

To Exhibit—*Foundromatic sand core drier, *type CW pump with automatic Texrope drive, *wall mounted, full voltage starter, high voltage air break contactor, thermal overload relay, panel of seven different types of rotary control switches, heavy duty pushbutton with magnifying glass to permit observation of rolling-wiping action, coolant circulating pumps

Representatives—A. F. Ziehm, W. A. Meyer, H. A. Wilson, H. A. Wright, B. H. Griffith, J. R. Roe, J. F. Dawson, R. M. Serota, J. E. Edelman, Alex Schlueter, all of Milwaukee

Allison Co., Bridgeport, Conn. 2008

Bridgeport, Conn.

To Exhibit—*Resinoid cut-off wheels, rubber cut-off wheels, demonstrations on four types of abrasive machines

Representatives—Grant Casserly, engineer in charge of service, Bridgeport; J. D. Hough, Western district sales manager, North Canton, O.; L. V. Wynkoop, field engineer, Wadsworth, O.; C. A. Nielsen, field engineer, Indianapolis

Aluminum Co. of America 2627

Pittsburgh, Pa.

To Exhibit—Continuous demonstration of high speed, automatic inert gas-shielded arc welding of aluminum stampings, 10 x 40-foot aluminum sign, aluminum street lighting standards, all-aluminum jacket water and lubricating oil cooler

Representatives—John R. Willard, manager, Development Division, New Kensington branch; Frank Jardine, manager, Development Division, Cleveland branch; G. O. Hoglund, head of welding section, Alcoa Process Development Laboratories; Russell V. Vanden Berg, head of finishes section, Alcoa Process Development Laboratories

American Brass Co. 331

New York, N. Y.

To Exhibit—Welding demonstration using Anaconda copper 372 welding rod on deoxidized copper sheets and plates by inert gas-shielded arc method, oxyacetylene welding with same rod, pressure vessel tank welded with the 372 rod by inert gas-shielded arc method, welding of thin sheet steel by inert gas-shielded arc using Everdur 1010 rods, and by oxyacetylene method using nickel silver 828 rods

Representatives—E. B. Tracy, general sales manager; C. E. Woodward, general manager of sales promotion; W. S. Girvin, W. R. Hibbard, V. P. Weaver, A. W. Tracy, assistant metallurgists; J. Imperati, R. F. Pulver, E. B. Brown, C. E. Swift, welding engineers; W. H. Dowd, exhibit manager; H. M. Paxson, district sales manager, Cleveland; C. G. Goodman, C. V. Hower Jr., W. G. Hummell, G. E. Newton, G. W. Wyckoff, Cleveland sales representatives

American Chain & Cable Co. Inc. 925

Bridgeport, Conn.

To Exhibit—*Model MO Tukon microhardness tester, by Wilson Mechanical Instrument Co. Inc., subsidiary; model 15 wet or dry bar type abrasive cutting machine

Representatives—Campbell Machine Division: V. E. Lysaght, sales manager; William Leopold, factory representative; Preston A. Kenyon, Detroit, C. H. Thompson, Cleveland, Paul Fee, Chicago, James L. Kalvalaris, Indiana, Robert B. Coleman, Philadelphia, Otto H. Shettler, New York, representatives. Wilson Mechanical Instrument Co.: Same as for Campbell Machine Division, plus Stanley P. Rockwell Co., northeast representative; Pacific Scientific Instrument Co., West coast representative; Upton Bradeen James, Canadian representative

American Cyanamid Co. 1704

New York, N. Y.

To Exhibit—*Calcium Cyanamide 6-16 for nitrogen ladle additions to steel, Aerocarb E & W in the operation of a salt bath furnace featuring an economical easy washing process, Aeroheat 1190 neutral salt bath for heat treatment of medium and high carbon steel without decarburization, as well as for hardening of carbon and alloy steels, reheating carburized work, annealing, brazing and heating for austempering, martempering and isothermal quenching

American Non-Gran Bronze Co. 2819

Berwyn, Pa.

To Exhibit—Parts cast of bronze or machined of such metals as beryllium copper, Ni-Resist cast iron, stainless steel, etc.; cam for water filter pump cast of Non-Gran bronze

American Wheelabrator & Equipment Corp. 2016

Mishawaka, Ind.

To Exhibit—*15-inch continuous Wheelabrator Tumblast, *Tru-Steel shot 48-inch Wheelabrator swing table, standard Dustube dust collector

Representatives—C. A. Pfaff, president and general manager; L. L. Andrus, vice president in charge of sales; S. S. Deputy, sales manager; A. E. Lenhard, advertising and sales promotion manager; K. H. Barnes, chief engineer; C. R. Cline, assistant to the president; C. F. Ludwig, David Logan, F. W. Pedrotty, J. N. Harper, F. E. Uhl, V. S. Spears, A. D. Stimmler, R. A. Campbell, J. D. Alexander, E. B. Rich, C. L. Benham, Russell Duer, R. L. Orth, G. R. Bryant, sales representatives

Anker-Holth Mfg. Co. 2650

Port Huron, Mich.

To Exhibit—*Simple Airdraulic cylinder, line of air and hydraulic cylinders, line of valves, working exhibit on Warner & Swasey lathe showing air chucks and rotating cylinders in use

Representatives—Elmer Pfeil, Lewis Snellgrove, Cleveland representatives; W. L. Komph, vice president; Mr. Johns, assistant sales manager; Mr. Theisen, vice president in charge of manufacturing; Harry Hepler, experimental engineer

Arcos Corp. 1125

Philadelphia, Pa.

To Exhibit—*Mixend 99 and Mixend 60 arc welding electrodes for cast iron welding, *Nickelend 811 pure nickel electrode for welding nickel, nickel clad, nickel to mild steel and applying a nickel overlay

Representatives—J. R. Collins, P. L. Edmonds, W. G. List, D. C. Mockus, C. T. Posey, J. J. J. Schlass, B. E. David, field engineers; J. K. Light, manager, New England district office; J. E. Norcross, sales manager; C. M. Schaub, manager, Philadelphia district office; E. M. Blanchard, treasurer; H. W. Dotzenroth, purchasing agent; R. E. Gallagher, secretary; C. R. Moran, secretary to sales manager; H. E. Snyder, advertising manager; R. D. Thomas, president; R. David Thomas Jr., vice president and director of research

Aronson Machine Co. 2560

Arcade, N. Y.

To Exhibit—*Model 14C1000 universal balanced positioner of 1000 pounds capacity, others in line of balanced positioners

Representatives—Barney R. Aronson, vice president and sales manager; Roy Norton, Norton Inc., Milwaukee; Clayton B. Herrick, C. B. Herrick Co., Cleveland; Charles S. Freeman, Charles S. Freeman Co., Buffalo; Arcos Corp., dealer in Philadelphia and Hartford, Conn.

Austenal Laboratories Inc. 931

New York, N. Y.

To Exhibit—Microcastings for industrial use, power blading for aircraft gas turbine field

Representatives—J. J. Erdmann, general manager, New York; P. F. Collins, assistant general manager, Chicago; A. W. Merrick, chief metallurgist, New York; R. L. Wiseman, sales manager, New York; W. W. Troupp, E. L. White, Jr., sales representatives, New York; J. M. Uhle, sales representative, Chicago

Baker & Co. Inc. 2419

Newark, N. J.

To Exhibit—*Nitroneal generators, items made of silver, platinum and other precious metals having specific uses in industry

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teel Tubing

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Representatives—M. M. Waller, sales engineering; E. J. Emerson, engineering; W. C. Fagans, C. A. Weller, sales

Baldwin Locomotive Works 1033

Philadelphia, Pa.

To Exhibit—Presses and testing equipment

Representatives—R. G. Tabors, sales manager, presses and power tools; E. J. Doolittle, district sales representative, Cleveland office; W. C. Kriebel, assistant advertising manager; George Walsh, sales promotion manager, Testing Division

Cyril Bath Co. 2138

Cleveland, O.

To Exhibit—*Shear attachment to make a shear out of any press brake, contour former, Sturdybender press brake in operation

Representatives—Cyril Bath, president; Richard Humiston, treasurer; Paul Ostrander, sales manager; Robert MacKenzie, chief engineer; Henry Hein, works manager; Frank Phillips, sales engineer

Bausch & Lomb Optical Co. 432

Rochester, N. Y.

To Exhibit—*Demonstration of phase contrast accessories for metallography

Representatives—M. H. Stevens, manager of industrial sales; P. M. Stoehr, assistant manager of industrial sales; K. E. Reynolds, manager of analytical sales; H. L. Shippy, manager of Detroit office; J. O. Wexlin, manager of Philadelphia office; J. H. Mead, district representative, Chicago; L. V. Foster, J. R. Benford, optical designers

G. S. Blakeslee & Co. 2236

Chicago, Ill.

To Exhibit—Solvent vapor degreasers in operation, metal washers, Blacosolv

Representative—J. R. Cessna

Charles Bruning Co. Inc. 2101

Chicago, Ill.

To Exhibit—*Whiteprinter model 50, *office model 10 Whiteprinter, Volumatic model 93 for large volume production, model 21 for small volume, Equipoise standard drafting machines, lettering guide, Perspect-O-Matic for making drawings in perspective, hollowshaft electric erasing machine, Hamilton four-post drawing tables, 5 and 10-inch slide rules, drawing board cover paper, refillable pencils, tracing papers, drafting room supplies

Brush Beryllium Co. 2554

Cleveland, O.

To Exhibit—Precision cast beryllium copper and beryllium nickel, hot pressed beryllium copper molds for molding plastics, beryllium oxide crucibles for high temperature (2000° C) use, large pure beryllium metal fabricated sections, model of plant process for extracting beryllium products from ore

Representatives—N. W. Bass, assistant vice president; Lyman A. Fowles, field representative

Buehler Ltd. 513

Chicago, Ill.

To Exhibit—Apparatus for preparation of metallographic samples

Representatives—Adolph I. Buehler, general partner; George W. Graves, sales manager; Erich J. Weidner, Frank A. Restivo, sales and service engineers

Champion Rivet Co. 531

Cleveland, O.

To Exhibit—Welding electrodes and their applications, special upset forgings, rivets, movie of machine for imprinting of electrodes

Representatives—T. P. Champion, president; T. J. Lawless, vice president; R. J. Champion, welding engineer; D. J. Schaefer, technical sales; C. Louis, development engineer; C. L. Shipley, Western sales manager, Chicago; D. J. Champion, Cleveland sales

Cleco Division, Reed Roller Bit Co. 2562

Houston, Tex.

To Exhibit—*A-3 reversible pneumatic rotary impact wrench, A-1 reversible pneumatic screwdriver, 1480 edge grinder

Cleveland Punch & Shear Works Co. 1837

Cleveland, O.

To Exhibit—Cleveland 10 I inclinable press of 90 tons capacity, equipped with drum type air-operated friction clutch with spring-loaded brake; separate drum type clutch and brake unit mounted on stand for inspection of construction and operation; Cleveland 7 I inclinable press of 45 tons capacity, equipped with treadle-operated pin type clutch

Representatives—Florence M. Sayle, president; A. J. Fitzgerald, general manager; H. J. Corrin, vice president; A. W. Schultz, sales manager; W. J. Stewart, advertising manager; J. N. Weiland, chief engineer; R. S. Howell, Detroit, C. W. Hancock, New York, P. J. Hopkins, Cleveland, district managers; W. D. Sayle, sales department; T. Asbury, shop superintendent; F. Wilmer, mechanical engineer; H. A. Schultz, assistant sales manager

Continental Industrial Engineers Inc. 2744

Chicago, Ill.

To Exhibit—*New process and equipment for removing scale and polishing stainless steel, chrome alloys, etc.; *process for heating metals in hydrous solution; *continuous ferrous and nonferrous bright strip annealer; *mechanized plow share heat treating production line (all of above processes are being revealed for the first time at the show; equipment will not necessarily be shown)

Representatives—W. A. Darrah, president; R. A. Hastings, T. W. Allsworth, vice presidents; C. P. Masure, purchasing agent; H. L. Wentworth, assistant chief engineer; R. E. Angley, estimating engineer

Crane Packing Co. 836

Chicago, Ill.

To Exhibit—*Model 24 Lapmaster, model 12 Lapmaster, both in operation; actual lapping of various sizes and shapes of different materials

Representatives—F. E. Payne, president; K. V. Rohlen, vice president; H. I. Sole, manager, Lapmaster Division; F. White, Lapmaster technical; William Moffat, sales department; E. K. Brown, manager, Cleveland office

Detroit Testing Machine Co. 1616

Detroit, Mich.

To Exhibit—Photographs of various types of testing machines

Representatives—William Campbell, manager; Vincent Van Laan, sales engineer; Ralph Campbell

Distillation Products Inc. 1907

Rochester, N. Y.

To Exhibit—High vacuum equipment for use in metallurgy field for producing pressure below 1 mm of mercury

Representatives—Carl W. Herrmann, W. F. Dolke, Tom Comer, Everett M. Brown, sales engineers; A. H. Hartman, sales manager; Gordon Gerow, development engineer; Dr. George Bancroft, development supervisor

DoAll Co. 1135

Des Plaines, Ill.

Representatives—L. A. Wilkie, chairman of the board; R. J. Wilkie, president; J. W. Wilkie, vice president; L. R. Rothenberger, general manager; C. H. Rosene, director of public relations; L. Ericson, V. Childers, N. Trowbridge, G. Connoy, E. Drew, machine engineers; R. Anderson, laboratory technician; J. Harrington, chief engineer; G. Sheppard, laboratory research engineer; K. Glader, J. Spooner, H. Pottle, sales engineers; M. Hanson, general manager, DoAll Cleveland Co., Cleveland; C. Buxton, O. Ruh, L. Borgeson, sales engineers, DoAll Cleveland Co.; C. Hartwig, general manager, DoAll Toledo Co., Toledo, O.; R. Harjula, sales engineer, DoAll Toledo Co.

Dow Chemical Co. 401

Midland, Mich.

To Exhibit—Display of completed parts of magnesium; magnesium castings, extrusions and sheet for aircraft; cutaway corner section of truck body and truck wheel; gasoline tank truck; hand tools; ladder; textile warp beam; various forms in which magnesium is available, including castings, extrusions and sheet, plus small fabricated products

Representatives—W. S. Loose, magnesium sales manager; T. H. Caldwell Jr., die casting sales manager; G. W. DeKuiper, wrought products sales manager; J. C. H. Stearns, ingot sales manager; H. W. Dove, foundry sales manager; C. E. Lehnhardt, fabrication sales manager; W. H. Gross, magnesium publications; representatives from sales offices

Eclipse Fuel Engineering Co. 2847

Rockford, Ill.

To Exhibit—*Locktite manual reset safety shut-off gas valves, *McKee series CRS air control valve, *Vari-Flame burner, *line burner, *Consta-Mix proportioning valve, *Gas Pak conversion unit, *McKee steam scotch Pak marine type boiler fired with McKee Gas Pak burner, *piloted Walltite burner, standard burners, burner tips

Representatives—J. H. Sands, vice president in charge of sales; A. C. Perks, vice president in charge of manufacturing; A. D. Wilcox, vice president in charge of furnace and combustion sales; E. E. Magnuson, vice president in charge of boiler sales; representatives from central and eastern offices

Ekstrand & Tholand Inc. 2532

New York, N. Y.

To Exhibit—Units from automotive, toy and television industries, as well as structural parts, produced from iron powder

Representatives—N. K. Tholand, president; Jerome F. Kuzmick, manager, metal powder department; Thiel Dwyer, metallurgist

Elgin National Watch Co. 351

Aurora, Ill.

To Exhibit—Dymo diamond compound for finishing carbide dies and tools, steel molds and dies and production parts; Elgiloy spring alloy applications

Representatives—Roger F. Waindle, general manager, Industrial Products Division; John F. Ireland, sales manager, Industrial Products Division; W. M. Wochos, technical director, Sapphire Department; T. R. Green, technical director, Elgiloy Department; C. R. Meyer, sales representative, industrial products; W. M. Meehan, E. F. Allen, W. F. Meehan, New York, D. R. Pennington, Pennsylvania, E. Y. Moore, H. P. Norris, George Boullain, Ohio, R. L. Guimont, Indiana, H. P. Loewenberg, Connecticut, M. Matthews, Michigan, Dolph Boettler, Louis Hoppe, Missouri, all district representatives; Don Prentice, technical director, Abrasives Department

Eutectic Welding Alloys Corp. 1703

New York, N. Y.

To Exhibit—Continuous welding demonstrations in five booths;

Cast iron welding, arc, using EutecTrode 24/49, *240DC, torch, using EutecRod 14FC, 185FC, *EutecRod 146FC; steel welding, arc, using *Eutec-Hand-Omatic, 670, etc., torch, using Eutec-Rod 16FC; copper, brass, bronze welding, arc, using 280 electrodes, torch, using 1801 electrodes; aluminum welding, torch, using EutecRod 190, 210, 199; magnesium welding, torch, using EutecRod 1900

Foote Mineral Co. 2132

Philadelphia, Pa.

To Exhibit—Powdered ferro alloys, nonmetallic minerals and chemicals for coating welding electrodes, powdered metals, lithium chemicals for nonferrous welding fluxes, ductile zirconium metal, zircon sand for foundry cores

Representatives—L. G. Bliss, manager of distribution; B. E. Cass, welding engineer; W. M. Raynor, service engineer

Gas Appliance Service Inc. 2739

Chicago, Ill.

To Exhibit—*Roto-Flame heat treating furnace, Zig-Zag burner for high speed localized heating applications in flame hardening, brazing and spot heating

Representatives—E. A. Furkert, president; Paul Furkert, metallurgist; F. H. Koepke, W. A. Pyhrr, sales engineers; S. W. Butler, Cleveland, G. B. Duff, New York, M. C. Schwer, Detroit, district representatives

General Electric Co. 2108

Schenectady, N. Y.

To Exhibit—Inert arc and metal arc welders, welding accessories, industrial heating applications, heating devices, 300-amp direct current welder with plastic hood, line of alternating current welders in various sizes and ratings, engine-driven portable direct current welder, motion picture "Arc Welding at Work"

Claud S. Gordon Co. 2744

Chicago, Ill.

To Exhibit—Xactline straight line input control in operation on a model B-2 Lindberg laboratory furnace, furnace atmosphere indicator, thermocouple and accessories

H & H Research Co. 1758

Detroit, Mich.

To Exhibit—Model CX and EX reciprocating action tools and accessories, such as files, hones, polishers, etc.; model A Wen-Lyn pneumatic-reciprocating air hammers and accessories, such as peening tools, nose grooving chisels, face chisels, star drills, finishing tools, rawl chucks with turning devices, sheet metal cutter, etc.

Representatives—W. M. Smith, president; Murray Ehrenhaus, manager, Eastern territory; R. W. Cornwall, president, Cornwall & Co., Cleveland, Ohio representatives; E. W. Cornwall, sales manager, Cornwall & Co.; A. J. Byron, J. E. Seaman, John E. Tigue, Gardner Greene, salesmen, Cornwall & Co.; M. D. Heath, W. L. Pell, Bison Industrial Supply, Buffalo, Western New York representative

Handy & Harman 337

New York, N. Y.

To Exhibit—Demonstrations showing joining of ferrous and nonferrous metals with silver brazing alloys, Easy-Flo and Sil-Fos

Harshaw Chemical Co. 1532

Cleveland, O.

To Exhibit—X-ray diffraction apparatus, metal analyzer, metallographic equipment, analytical balance, muffle furnace, crucible furnace, combustion tubes, combustion boats, heat reflectors, Stanreduce for tin determination, filter paper, dripless spouts

Representatives—J. M. Manypenny, distribution manager; W. J. Welsh, merchandise manager; C. C. Ehle, D. Steigerwald, R. D. Jordan, sales

Haskell Mfg. Co. Inc. 2802

Pittsburgh, Pa.

To Exhibit—Work Flow drafting desks

Representatives—S. K. Haskell, president; E. N. Haskell, sales manager; Ed Sohn, production supervisor

Hauck Mfg. Co. 2703

Brooklyn, N. Y.

To Exhibit—Line of industrial oil, combination oil-gas and gas burning equipment

Representatives—A. J. Turpin, chief engineer; George J. Jonas, sales manager, Engineering Division; C. W. Hanlon, assistant sales manager, Engineering Division; H. H. Vogelsang, Cleveland district representative; William H. Oler, sales engineer

C. I. Hayes Inc. 1842

Providence, R. I.

To Exhibit—*LRP-10 lead pot, *AD ammonia dissociator, first controlled atmosphere electric tool furnace ever sold, conveyor sintering and hardening furnace

Representatives—C. I. Hayes, president; J. J. Walker, general manager; N. K. Pettigrew, assistant sales manager; W. R. Gilbert, chief engineer; H. Westeren, shop superintendent; L. J. Edwards, North East sales representative; J. M. Hines, sales engineer; C. G. Paulson, J. R. Elliott, W. C. Diman, service engineers; E. F. Burke, Cleveland representative; J. E. Figner, Pittsburgh representative; R. G. Hess, M. L. Ong, New York representatives; C. A. Hooker, Detroit representative; W. G. Praed, Chicago representative; Mrs. L. Brown, assistant treasurer

Haynes Stellite Co. 1926

New York, N. Y.

To Exhibit—*L-605 alloy, Stellite, Hastelloy and Multimet alloys in sheet, plate, bare stock, sand casting, precision casting and welding rod form, line of Stellite casting alloy cutting tools, hard facing rods, special machinery parts, display panel of samples of various shapes and finishes obtained by precision casting process

Heil Process Equipment Corp. 2628

Cleveland, O.

To Exhibit—*Designs and applications in lining and heating for pickling and plating; chemical-proof construction as applied to metal pickling, plating and finishing; complete processing units consisting of tanks, linings, impervious graphite heating units, baskets and crates; lined fume ducts and piping; waste acid and chemical disposal facilities; lined rail and tank trucks; storage tanks; lined pipe and pipe fittings; linings of Saran, Heilex, lead and Koroseal

Representatives—C. E. Heil, president; H. P. Heil, general manager; H. H. Blouch, manager of sales promotion; E. W. Vereeke, E. G. Huth, sales engineers

Heppenstall Co. 1115

Pittsburgh, Pa.

To Exhibit—Pictures showing sonic testing of die blocks and a variety of forgings, working models of Safe-T-Tongs and shear knives, die blocks

Representatives—H. O. Lang, vice president; S. J. Mergenhagen, assistant sales manager; D. P. Williams, L. R. Malm, sales representatives; R. E. O'Brien, district sales representative; J. O. Phillips, Pittsburgh sales department

Hevi Duty Electric Co. 509

Milwaukee, Wis.

To Exhibit—*Laboratory muffle furnace line, *small model of shaker hearth furnace

Representatives—Harold E. Koch, president; Norman C. Bloye, vice president; Arthur W. Frank, director of research; Arthur H. Oberndorfer, advertising manager; Laurence S. Tilden, Chicago district manager; Paul E. Crafton, Chicago office; Elton E. Staples, Cleveland district manager; George M. Brown, Cleveland office; Roger W. Carothers, Detroit representative; Robert A. Foley, Eastern district manager; Robert M. Palmer, John J. Farrell, Eastern district office

Hobart Brothers Co. 2544

Troy, O.

To Exhibit—*Line of Bantam Champ low cost arc welders, *model MZ-200-S 200-amp electric drive welder, *model ZXB-200-S 200-amp gas engine drive welder, standard line of multi-range dual control arc welders in electric motor driven and gasoline engine driven models, alternating current transformer type welders, inert gas-shielded arc welders, gasoline engine driven welders with auxiliary power, electrodes, accessories

Holcroft & Co. 2614

Detroit, Mich.

To Exhibit—Catalogs and photographs of heat treating equipment, including rotary furnace that can be used as batch type or continuous furnace, interchangeable gas and electric radiant tube heating, and high production batch type furnace

E. F. Houghton & Co. 939

Philadelphia, Pa.

To Exhibit—*Salt bath treatment for precious metals, illustrated case histories showing how metalworking products have reduced cost of manufacturing, heat treating salts, quenching oils, rust preventives, metal cleaners, lubricants, drawing compounds

Representatives—D. J. Richards, vice president-sales; James McElgin, manager, metalworking sales; J. C. Rovaldi, metalworking sales technician; H. E. Martin, Detroit Division sales manager; D. C. Miner, advertising manager; R. J. Rathbone, E. C. Redlin, F. J. Cawrse, C. H. Lloyd, L. C. Dunn, sales

HPL Mfg. Co. 1825

Cleveland, O.

To Exhibit—*Strip type U expander for hydraulic fluid sealing, *shank adapter for punch presses, metal stampings

Representatives—R. Hedberg, partner in charge of advertising; M. Lorentz, partner in charge of sales; E. Voytovich, assistant sales manager; T. K. Reid, in charge of estimating; V. S. Gilpin, production manager; S. S. Callner, W. K. Cochrane, C. A. Jones, H. G. Catlow, J. M. Leer, W. L. Engesser, E. J. Cannon, A. H. Trimmer, Gilbert L. Pike, V. A. Snyder, A. H. Burnap, sales representatives

Hupp Corp. 907

Cleveland, O.

To Exhibit—Tumbling barrel display

Representatives—R. V. Wright, assistant to president; R. T. Williams, C. W. Howard, sales engineers; John S. Sloan, advertising manager

International Nickel Co. Inc. 302

New York, N. Y.

To Exhibit—Specimens and case histories of castings and other products containing nickel, display of platinum group metals (platinum, palladium, rhodium, ruthenium, iridium) extracted

(*Please turn to Page* 180)

MARY BLAST FURNACE

Last of Hand-Filled Stacks in America

Original old stone stack built 104 years ago used raw coal as fuel. Raw materials were raised to top of furnace by water hoist. Present steam blowing engines have been in service nearly 50 years. Buggies of ore and limestone now are transferred from bin system to hoist cages by gasoline-operated lift trucks

By JOHN D. KNOX
Steel Plant Editor, STEEL

COMPARATIVELY few blast furnacemen can recall the hillsides being lit up throughout the night by the lazy yellow flames issuing from the tops of the old stone blast furnace over in the valley. Today, the old stone blast furnace is a thing of the past though the ruins of a few still remain as silent sentinels as a reminder of the days when the ironmaster was the jack of all trades.

But there is another landmark of the early days of the iron industry that has all but disappeared—that of the hand-filled blast furnace. Only one remains, the Mary furnace of the Sharon Steel Corp. at Lowellville, O. Construction of the original stack was started in 1845 by Wilkes, Wilkinson & Co., while native wars existed in the hills around Lowell, O., as the hamlet then was known. It was a stone stack — the Mahoning, by name—and was the first furnace in the United States to use raw coal which was mined near Lowell. The stack was blown in on this fuel Aug. 8, 1846, by John Crowther.

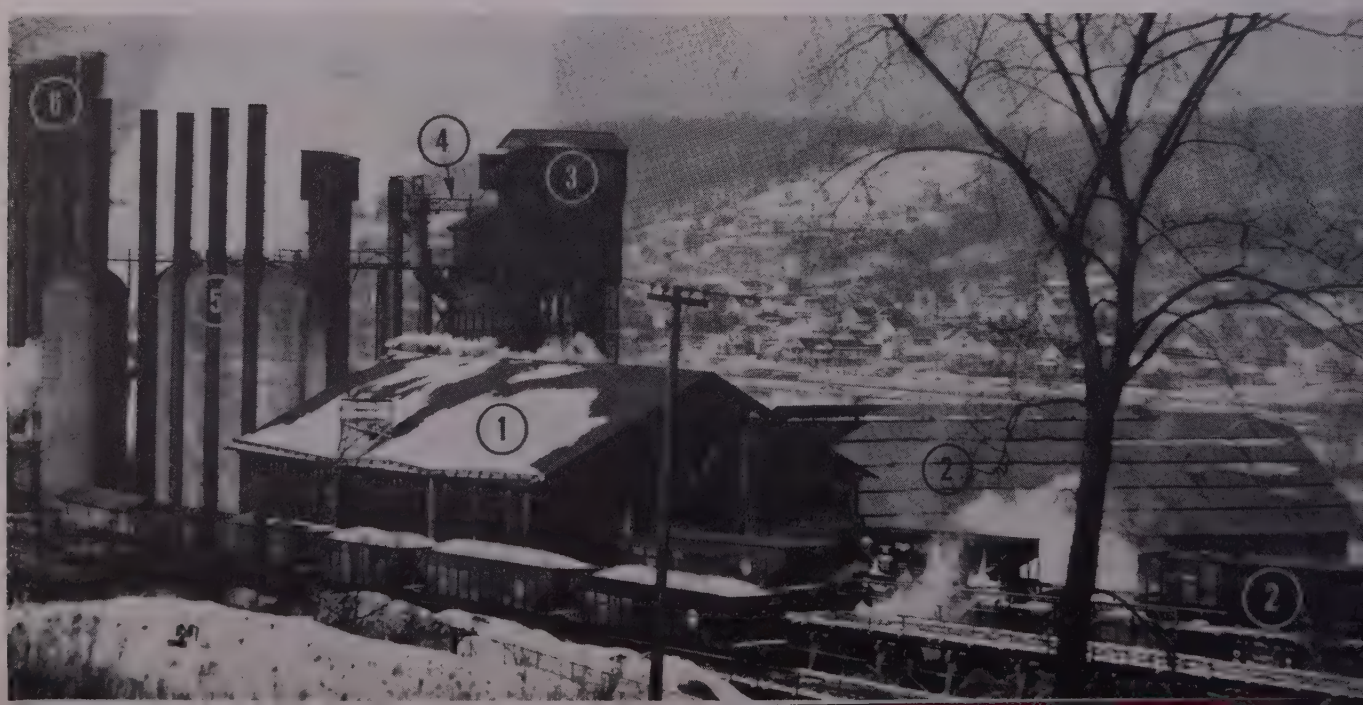
A sharp correspondence occurred in 1869 between the partisans of the Clay furnace located near the Ohio line on the Shenango river not far from Sharon, Pa., and those of the Mahoning furnace, as to their priority in the use of raw coal. The credit of making the first iron with raw bituminous or semibituminous coal in the United States belongs to one of these early furnaces.

Planned To Use Bituminous Coal— The original builders of the Mahoning furnace had planned to use for fuel bituminous coal from seam No. 1 common both in Youngstown, O., and Sharon, Pa., districts and known as "free burning splint", or "block coal"

Fig. 1—Closeup of elevator hoist which lifts buggies of ore, coke and limestone from stockhouse to top of stack

Fig. 2—General view of Mary blast furnace of Sharon Steel Corp., Lowellville, O.—the only remaining hand-filled stack in this country still in operation

1. *Stockhouse*
2. *Casthouse*
3. *Elevator hoist*
4. *Blast furnace*
5. *Hot blast stoves*
6. *Boiler stacks*



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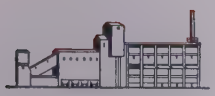

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Fig. 3—Trestle over which cars of ore, coke and limestone are brought and their contents unloaded in the bins beneath

and taken in the company's own mine in Lowell. Meanwhile, through a strike among their charcoal plant hands in July, 1945, Himrod & Vincent, then running the Clay stack, near Sharon, Pa., were compelled to use raw block coal for fuel. Officials of the Mahoning furnace, however, declared that this was an accident and a necessity whereas they were the first to blow in a stack built expressly to operate on raw coal.

Controversy ensued for years between the partisans of these furnace companies as to which belongs the honor of first using raw coal in smelting iron. But honors appear to be even: To the Lowellville stack as the first to blow-in and run its stack on bituminous coal; to the Sharon stack as the first to use raw coal for fuel.

The Mahoning stack was sold in 1853 to Alexander Crawford & Co. At that time the furnace was making 10.2 tons of iron a day using what was called Lower Coal Measure carbonate ore mixed with Lake Superior ore and rolling mill cinder.

Hitchcock, McCreary & Co., purchased the furnace in 1864 and, after operating it for a period of 7 years, sold it to the Mahoning Iron Co. Shortly thereafter it was purchased by McCreary & Bell.

Operated as Stone Stack — The Mahoning furnace was operated as a stone stack until 1872 when she was converted over to an iron stack, 56 x 15 feet, and her name changed to Ada. The stack now had a capacity of 8000 tons annually and operated on coke and block coal and Lake Superior ores.

The story is told that in the spring of 1868 and most any day of the week a bare-footed boy could be seen sitting on the hillside above the furnace watching the activity going on below—the ironbreakers swinging their 2-handled sledge or "welshman" as it was known, the 1-horse dump cart unloading sand in the cast house, top fillers getting buggies of raw materials from the elevator platform at the top of the furnace to the hopper, the stoveman releasing the blast into the air with a deafening roar. All these things and many more caught the observing eye of this lad and registered on his mind.

Fig. 4—Closeup of elevator and unloading platform at top of furnace. Steam exhaust indicates elevator is in operation

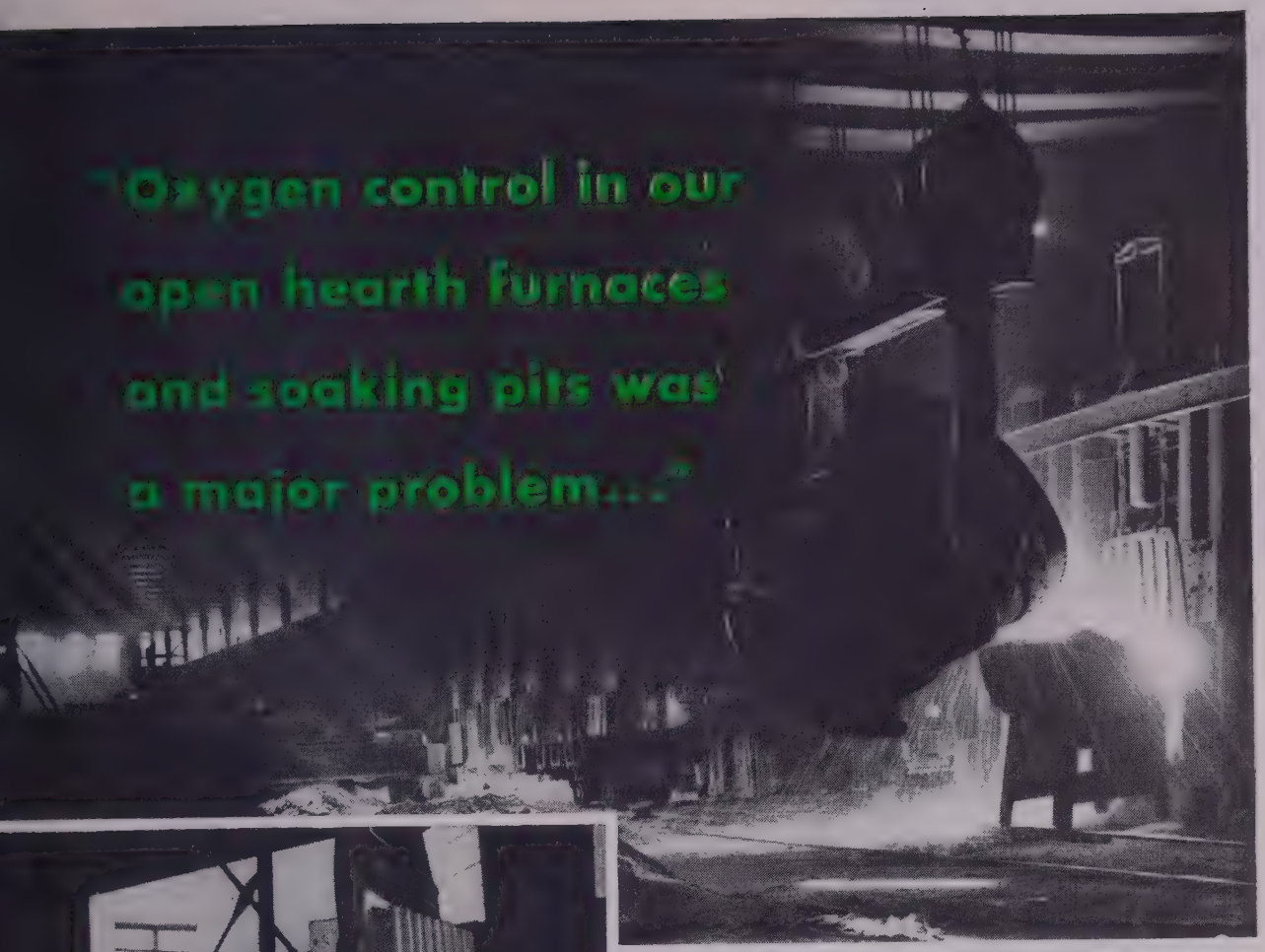
Little thought or attention was given him by the furnace crew. "Just another farmer's son taking a 'spell' from the plow handles to watch the ironmakers do their stuff," they said. "Let him watch and maybe he'll feel the urge to work in the casthouse one of these days and get himself all covered with sparkling graphite, who knows?" That was the sizeup the lad unbeknowingly received as he sat hour after hour watching iron in the making within 2 miles of his boyhood home.

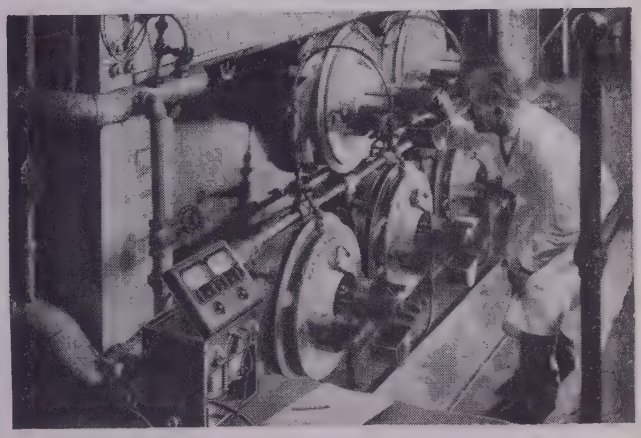
Years tumbled over each other and then it all happened. The lad became superintendent of the Brier Hill Iron Co., Youngstown, O., and the Struthers Furnace Co., Struthers, O., in 1876 and 1878, respectively. During the following 9 years he was manager of blast furnaces at the Edgar Thomson Steel Works, superintendent of the Lucy Furnaces and general superintendent of the Homestead Steel Works—all in the Pittsburgh district.

Doubles Iron Output—The lines of the stacks he built were seen in the best blast furnaces of his day. His great triumph was that he succeeded in making 2 tons of iron where only 1 ton was made before. His name greatly revered by those identified with the iron and steel industry in this and foreign countries, was Julian Kennedy—born in Poland township, Ohio, Mar. 5, 1852.

You never know what is back of a pair of observing eyes as they look through the wire fence at the product of the mills being laid down on the exterior cooling beds, or as they follow the flow of molten metal down the runners of any cast house. Feasting eyes frequently lead to the awakening of slumbering potentialities and in less than a generation a name appears on the letterhead of "big steel" whose personage began to show life when he had his first look at dancing coke through the peephole in a blast furnace tuyerestock, or at a bath of molten steel through the wicket of an open-hearth door. That is what happened to Julian Kennedy.

Returning to the historical account of the furnace, it is recorded that the property was incorporated on Feb. 9, 1880 by Henry Wick as the Ohio Iron & Steel Co., and the name of the stack changed from Ada to its present name Mary. Hot blast at that time was supplied by a small blowing engine and two cast-iron pipe stoves. The cast house was built of wood. The first week the stack was blown in





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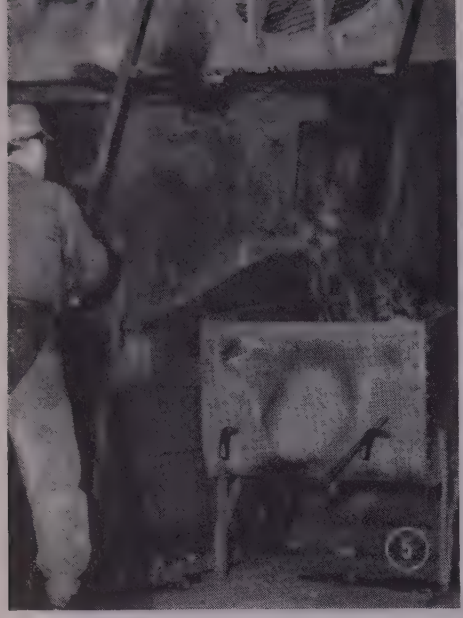


Fig. 5 — Coke puller loading buggy of coke from stock bin

under the new management it produced 91 tons of iron.

"Water-Powered" Hoist—The hoist serving this stack was built with a wooden frame and was operated by gravity. Iron tanks were fitted beneath the floor of the hoist cages. One of the charging crew, known as the "top-filler", filled the tank of the empty cage at the top of the furnace with water from a tank, and at the proper signal from below, loosened the friction brake on the rope drum. The unoccupied cage would start downward with its heavy load of water, which overbalanced the cage on the other side loaded with either barrows of fuels, limestone or iron ore. When the water-loaded cage reached the bottom of the hoist, a valve on the underside came in contact with a stopper and thus discharged the water automatically.

An overhauling, started in the spring in 1883, included a new hot blast stove containing 60 cast-iron pipes, a new stockhouse, two new boilers, a trestle, replacement of the wooden hoist with an iron hoist, and the installation of a Weimer-type steam blowing engine with a blowing tub, 84 x 48-inch. The height of the furnace was increased to 60 feet. Production in August, 1883 amounted to 605 tons, making the plant the second largest production works in the country. Gray iron and the brand "Mary" was rigorously pushed by the sales department.

During 1888-89 the output of the stack was further increased, the annual capacity amounting to 60,000 tons. Iron was sold throughout New England and the Eastern Seaboard taking the place of the best Scotch iron.

A record taken from the company's books in 1892 reads:

"Experience taught the greatest care in the manufacture of our product by the association of daily analysis. We are able to preserve uniformity that sustains its demand."

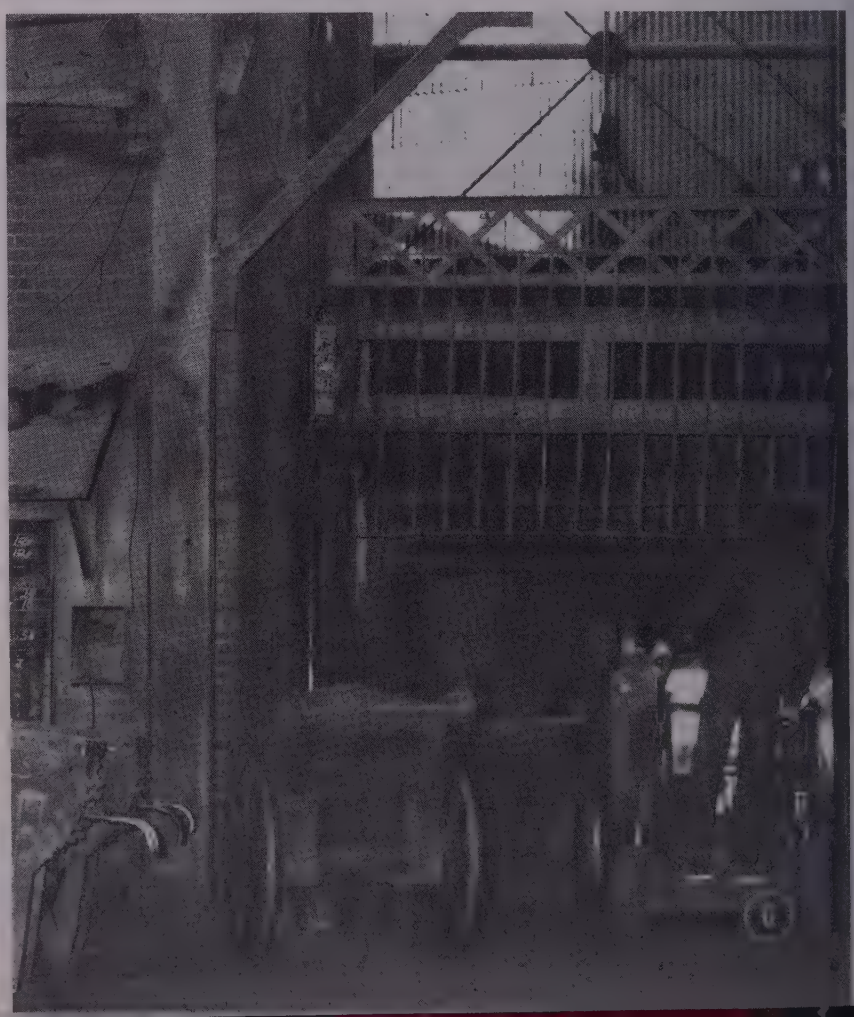
This infers that a chemical laboratory was installed in the early 90's for just prior to this, samples were being sent to Youngstown for analysis. About this time depression hit the plant. Management put it up to the men around the furnace to take a cut in wages. This they willingly did. When market conditions became favorable again, regular wages were restored and a bonus given the men to compensate for the cut. Lest this incident be passed over unnoticed, may it be said that this was Americanism at its best.

Stack Enlarged — Plant improvements were made rather freely from 1890 down through the years including stoves, blowing engines, boilers, pumps, pig machine, etc. The stack was enlarged and rebuilt several times. Up until 1902 the molten slag was flushed into a yard, broken up by hand and hauled away in a mule-drawn 2 wheel dump cart; but in that year a new procedure was adopted. The slag was granulated in a pit and transferred by crane and grab bucket to gondola cars at a saving of 13 men per day. Five years later the installation of a mechanical pig breaker released 18 additional men for other duties.

Digressing momentarily from the Mary stack to pick up background material, the board of directors of the Youngstown Iron & Steel Co., in 1914 authorized the construction of a steelworks and rolling mills to supply sheet bars to its sheet mills located at Hazelton, within the city limits of Youngstown, O. Pig iron for its open-hearth furnaces was to be supplied by the Mary furnace at Lowellville, O., 3½ miles south of the Hazelton plant. Because of this distance and the difficulties involved in the transfer of hot metal and securing additional land at the Hazelton site, it was thought best to locate the steelworks and semifinishing mills at Lowellville, O., within 1¼ miles of the Mary blast furnace.

Ground was broken for the steelworks in July, 1914 and the first ingot was poured July 31, 1915. The plant is built at three different levels, the rolling mills and pouring bay of the open-hearth shop are on one level, the open-hearth storage

Fig. 6—Gasoline operated tractors loading ore and coke buggies on elevator platform



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yard and charging floor about 18 feet higher and the gas producers about 10 feet above this level. The original steelmaking shop included three 75-ton open-hearth furnaces. The shop is connected with the Mary stack by a company-owned railroad over which hot metal is carried directly to the charging floor.

Control of the Youngstown Iron & Steel Co., was acquired by the Sharon Steel Hoop Co., Sharon, Pa., now the Sharon Steel Corp., on Feb. 13, 1917, and on Feb. 1, 1918 Sharon acquired the Mary blast furnace with 200 surrounding acres from the Ohio Iron & Steel Co. The stack at that time was 85 x 18 feet and had a rated capacity of 350 tons per day.

At the time Sharon Steel Hoop assumed control of the Mary stack there was an Italian working in the furnace yard by the name of Pietro Pirone. He went on the payroll of the furnace back in 1901 when 38 years of age; he was 86 last Oct. 29. Pietro is tall, slightly stooped and gets around with the aid of a cane. When he started at the Mary furnace he drew $1.25 a day for a 12-hour turn, loading and unloading cars. There were no locomotive cranes or grab buckets serving the furnace yard then; everything was done by hand and the labor gang used larger shovels and heavier picks than are wielded today. It wasn't easy going for Pietro.

But there was a man up in the cast house who took the sting out of Pietro's workday. He was a cinder snapper on the furnace, that is, he looked after the cinder notch, tapping the slag over a sand-lined runner into the pit and cleaning up the trough for the next tap of cinder. Night after night Pietro could be seen turning in the walk leading to the front door of the cinder snapper's home over on Jackson street in Lowellville and there by the light of an oil lamp, the cinder snapper taught Pietro to write his name and brush up on his English; later he helped him get his citizenship papers. Ask Pietro the name of this cinder snapper and he'll tell you with a measure of joy that only a furnaceman understands:

"His name was Henry Roemer, the dad of Henry Roemer up in Sharon, our big boss. You never knew any good feller like him; they don't make 'em any more." And if you would observe pride at its best you would only have to look at the expression on Pietro's face as he related this incident.

Fig. 7—Top filler pulling buggy of coke from elevator platform preparatory to dumping it into furnace hopper at top of furnace

Fig. 8—View of top rigging showing sprays of water being directed on iron ore charged on bell and hopper ready for dropping into furnace

Output More than 350 Tons—But at the moment the stack is holding her own. She is 81 feet high with a 13 foot 6-inch hearth and while rated at 350 tons a day, her output is in excess of this figure. The stack is blown with fourteen 5 x 12-inch tuyeres. Blast of 30,000 cu ft per minute is supplied by two vertical Tod steam blowing engines with one held in reserve as a spare. These engines with a stroke of 60 inches and an air chamber 84 inches diameter, have been serving the furnace for almost 50 years. Five Cowper-Kennedy type stoves, 80 x 18 feet and with 5½-inch checkers, heat the blast; two stoves are on line at all times to maintain a straight-line temperature of 1050° F.

In former years 21 men were required to operate the stockhouse per turn of 12 hours. These men pulled the empty ore and limestone buggies from the bottom of the hoist to the respective piles, some of which were located many hundred feet away, loaded them by hand with 1700 pounds of iron ore, pulled them over a floor scale to check the weight, and thence to the elevator to be hoisted to the top of the furnace. The bottom fillers were husky fellows; they had to be to stand up under the stockhouse chores requiring brute force 365 days a year.

But that is all history now for the stockhouse at present, instead of requiring 217 men a turn, does the same work with 15 men. The ore is unloaded from gondola cars from the trestle into a bin system from which it is discharged through doors into the buggies beneath. The same type buggy that was used for handling the

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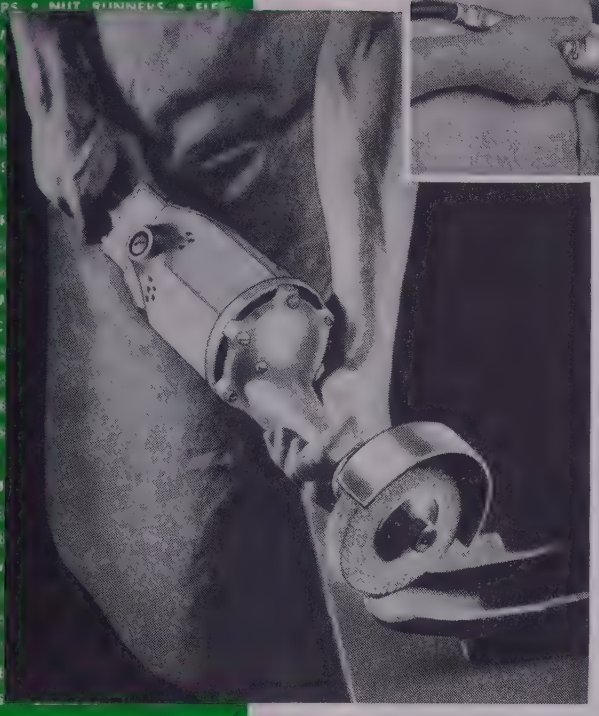

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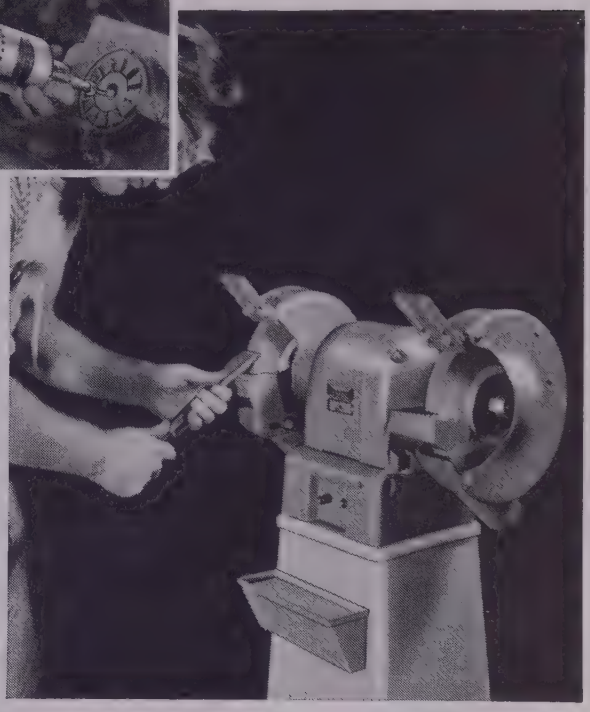

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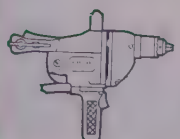

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Fig. 9—Top filler dumping buggy of coke onto bell and hopper at top of furnace

ore years ago still is in service but instead of being pulled by men it is handled by gasoline-operated lift trucks from ore bins to hoist platform and back again.

And so today, up against the hillside not far from the Mahoning river in Lowellville, O., about 8 miles south of Youngstown, O., stands the Mary stack, still making iron—last of the hand-filled blast furnaces in the United States; the "last of the Mohicans." And if you should happen to be traveling between Youngstown and Pittsburgh either on the Erie or Pennsylvania railroad you had better take a peek at "Mary" as you pass through Lowellville for when "she" makes her last cast sometime in the tomorrows, it will spell the passing of one of the landmarks of the pig iron industry.

Continuous Strip Fasteners

SAVINGS in assembly time are possible with flat-type Speed Nuts, now being produced in a continuous strip by Tinnerman Products Inc., Cleveland. The tandem-type fastener consists of a strip of pretempered spring steel into which the fasteners are stamped, a partial shear separating each unit. This permits the operator to break the strip from leading nut with a clean separation as it is tightened.

Leading Speed Nut is at the tip of the screw driver at all times, increasing assembly efficiency by eliminating the motion wasted in selecting a fastener, picking it up and carrying it to the work. Locating the nut and starting the screw is facilitated since the longer strip is handled easier than the individual nut. The new fasteners are now available in 10-24 screws either stripped or coiled. They will be produced in popular screw sizes.

Aids Small Business

AN AID to present and prospective small businessmen is given in a packet of eight official publications on various phases or problems of small business, available through Superintendent of Documents, Government Printing Office, Washington 25, D. C. Designated as Catalog No. SB-49 the publications, price of which is $1, are entitled: Small Business and Government Regulations; Small Business and Regulation of Pricing Practices; The Small Businessman and His Bank; Small Business and Government Licenses; Small Business and Trade-Marks; The Small Businessman and Sources of Loans; The Small Businessman and His Financial Statements; and Guides for New World Traders.

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STRUCTURAL rigidity, high deflection value, greater wind strength and ability to carry a higher ice load are advantages of Perma-tube electric weld tubing as used in the manufacture of television antennae. Produced with a Vinsynite pretreatment and a pigmented coating with a tough vinyl resin base by Jones & Laughlin Steel Corp., Pittsburgh, the tubing is being applied to the manufacture of Minute Man series of television antennae by Ward Products Corp., Cleveland.

Protective finish applied is said to provide an almost completely impervious film which is durable and resistant to atmospheric corrosion as well as acid and alkali. Under bending, expanding and other cold-forming, the finish flows with the metal and is said not to chip or flake off within distortion limits of the steel.

Fast Analyzing Procedure

CONSTITUENTS of such deposits as boiler scales may be identified within hours or even minutes by the use of the spectrograph technique by Hall Laboratories Inc., Pittsburgh. Use of this instrument in the solution of water problems makes it possible to find the cause of a boiler tube failure with little or no delay.

Sample is "burned" in a direct current arc, where the intense heat of 5000 to 10,000° F breaks down practically all compounds into their elements. Most of these are gases at such temperatures, and give off light of definite, sharp wave lengths. These are "sorted out" by the spectrograph, so that they are observed as a series of lines of different colors, or are recorded on photographic film.

Method permits quick identification of even minute or "trace" metallic constituents. The spectrograph can also establish the absence of elements from a material so that the chemists making separations can ignore these substances as potential constituents, and concentrate their investigation elsewhere.

Metal show's practical theme reflected in

TIMELY TECHNICAL PAPERS

THIS year's American Society for Metals technical papers are directed more than ever to the practical aspects of today's metalworking and metal performance problems. All phases of the metal industry and metallurgical science are represented, as evidenced by the following session topics: Alloy steels, oxidation, quenching, high temperature metallurgy, transformation and temper brittleness, stainless steels, mechanical metallurgy, atomic energy metallurgy and nonferrous.

Central theme of the American Welding Society, "For economy in production—weld," is reflected in the technical papers, grouped in the following subject categories: Structural design, welding pressure vessels, hard facing and flame hardening, resistance welding, welding nonferrous metals, aluminum, stainless steel; weldability, inert gas welding and gas cutting, symposium on ship structure.

The following are abstracts of some of the papers to be presented before sessions of the ASM and AWS:

—ASM—

Fabrication Properties Of Ductile Zirconium

By E. T. Hayes, physical metallurgist, and E. D. Dilling and A. H. Roberson, metallurgists, Bureau of Mines.

ZIRCONIUM metal produced by reducing the chloride with metallic magnesium has been forged and rolled at 1560° F to satisfactory sheet and rod by protecting the metal from oxidation with an iron sheath. It is possible to produce equally as satisfactory sheet by hot rolling the forged ingot at 650° C (1200° F) in air. Success of the latter method depends on satisfactory scale removal by sandblasting and pickling in a dilute hydrofluoric acid—lead nitrate solution. The metal can be successfully drop-forged and stamped, using standard commercial dies and equipment.

Tensile strength of the sheet rolled at 1560° F was increased by cold rolling from 63,500 psi to 93,500 by 90 per cent cold reduction with no evidence of overworking. Hardness rose from Rockwell B-86 to B-98 with over 70 per cent of the work hardening occurring during the first 20 per cent of cold reduction.

Annealing the sheet prepared by rolling at 1200° F caused the tensile strength to drop from 86,400 to 80,000 psi at 750° F and to 59,000 psi at 1290° F. Temperatures up to 2010° F did not materially lessen this value. Material rolled in air at 1200° F before cold rolling had tensile properties that were very similar to those obtained on the sheet rolled at 1560° F, the major deviation being a 2 per cent increase in elongation for the 1200° F sheet. Annealed and hot-rolled zirconium sheet was bent 180 degrees on a 3 T radius. Cold working seriously impairs workability, the 10 per cent cold work sheet requiring 8 T, and 20 per cent reduction 12 to 16 T for a 180-degree bend.

Zirconium was swaged into rods, being readily worked at 1200° F. Rods below ⅜-inch diameter were annealed by resistance heating. Wire was successfully drawn, with the oxide skin produced by air annealing providing a satisfactory lubricant in preventing die seizure.

Quenching, Effects on Tensile Properties of Aluminum 61S

By R. C. Lemon, research metallurgist, and H. Y. Hunsicker, assistant chief, Cleveland Research Division, Aluminum Research Laboratories, Aluminum Co. of America

PRIMARY objective of the investigation was to determine merits of a heat treating procedure, termed quench-aging compared with the conventional quenching and aging of alloy 61S. Sections of sheet or plate ranging from 0.083 to 2¼ inches thick were solution heat treated at 970° F and quench-aged in molten salt at 320, 360 and 400° F. Similar specimens were solution-treated, quenched in various media and artificially aged at the same temperatures.

At comparable quenching rates, the tensile strength values obtained by quench-aging were higher than those produced by the conventional procedure when a few hours of natural aging intervened between quenching and artificial aging. However, specimens quenched in cold water and immediately heated to the artificial aging temperature developed higher properties than quench-aged specimens under comparable conditions. This was attributed to the lower cooling rate in molten salt.

The temperature range of 700 to 500° F was established as the most critical with respect to hardening capacity of alloy 61S, although the tensile properties were improved with increasing quenching rate throughout the temperature range from the solution temperature to the aging temperature.

Arc-Melted Molybdenum-Rich Chromium-Molybdenum Alloys

By H. D. Kessler, research metallurgist, and M. Hansen, senior metallurgist, Armour Research Foundation

CHROMIUM-molybdenum alloys containing 60 to 100 per cent molybdenum were arc-melted and cast in an argon atmosphere. Melting method consisted in fusing consumable electrodes made by powder metallurgical techniques. Carbon and beryllium were investigated as possible deoxidizers. The measured lattice parameters check the results of other investigators, and the body-centered cubic alloys show complete solid solubility.

Oxidation resistance in a static air atmosphere was evaluated at 1200, 1500 and 1800° F. Oxidation resistance generally increases with increased chromium content. At 1500° F alloys with less than 20 per cent chromium oxidized at high rates. At 1800° F all alloys oxidized at high rates under the conditions of the test. Unless protective coatings are applied, it is doubtful that these alloys will prove useful at 1500° F or more in oxidizing atmospheres.

Forgeability at 2300 to 2500° F decreases markedly with increased chromium content. Hardness up to 1600° F increases rapidly to more than 600 DPH at 27 per cent chromium. Additions of as little as 1 per cent chromium greatly improve the hot hardness of molybdenum.

New Criteria for Predicting Press Work in Deep Drawing

By W. T. Lankford, S. C. Snyder and J. A. Bauscher, Research and Development Division, Carnegie-Illinois Steel Corp.

IN the past it was generally believed that an isotropic material is more suitable for all types of sheet metal forming operations than an anisotropic material. Evidence was developed in the present investigation which refutes this general belief. Athough it is still believed that an isotropic material is best suited for symmetrical formations, it was demonstrated that, for certain unsymmetrical formations, material having a considerable degree of plastic anisotropy of a favorable nature results in the best press performance.

By considering favorable plastic

anisotropy together with favorable strain hardening characteristics as requisites for good press performance, it is possible to discriminate very successfully between materials having quite similar ordinary mechanical properties but which exhibited wide differences in press performance in unsymmetrical fender draws. A good correlation was found between plastic anisotropy and magnetic anisotropy, indicating that the plastic anisotropy arises from preferred crystallographic orientations. These new findings suggest that for optimum press performance the plastic anisotropy characteristics of the material must be suited to the symmetry of the forming operation.

Stress Corrosion in a Stainless Steel Compressor

By Frank W. Davis, chief metallurgist, E. B. Badger & Sons Co.

THIS paper discusses the failure of a stainless steel turbocompressor through stress corrosion of two rotors. The unit was used to compress steam which was subsequently condensed for use in a chemical process requiring water of the highest purity obtainable. Chlorides were contained in both the raw water supply and leachings from parts of the failed unit. The condensate produced contained less than one-half ppm of total solids. Excessive dynamic stresses were imposed on all rotors by the removal mechanically of unequal lengths from all vane tips.

Two rotors failed completely through transcrystalline cracking. One side only of each of the adjacent rotors contained pronounced stress patterns of incipient transcrystalline cracks. No evidence of corrosive attack could be detected on the inside surface of the compressor casing except in the two stages in which rotor failure had occurred, where a decided stain pattern indicated the presence during operation of a fluid at least mildly corrosive. Data from a second compressor, which operated under identical conditions with no evidence of similar stress corrosion, are included for comparison.

Engineering Analysis of Quench Cracking in Steel

By Cyril Wells, metals research laboratory, Carnegie Institute of Technology, and J. W. Spretnak, associate professor of metallurgy, Ohio State University

AS a result of a statistical analysis of thousands of quench cracking data obtained in commercial practices, a considerable amount of information relating to the problem of quench cracking in hollow cylinders has been disclosed. In industry, quench cracking epidemics occur; these are quite serious in intensity, relatively short in duration, and are usually separated by long-time periods in which losses due to quench cracks are low and intermittent.

Cracking susceptibility appears to be a heat characteristic; losses per heat ranged from 0 to 100 per cent in practices where steel chemistry, steel quality, and heat treatments appear to be unusually well-controlled within narrow control limits. The effect on quench cracking of each of the following variables—pouring temperature, ingot size, forging reduction, position of steel in ingot, composition, hardenability, uniformity of quenching conditions, temperatures to which cylinders are quenched, and special pre-bore quenching treatments —has been determined. Among the remedies tried for the purpose of preventing quench-cracks, that of prebore quenching appears to be one of the most effective.

Determining Oxygen in Metals By Vacuum Fusion Method

By R. K. McGeary, J. K. Stanley and T. D. Yensen, Research Laboratories, Westinghouse Electric Corp.

AN improved type of vacuum fusion apparatus for the determination of total oxygen in metals will be described and its operation indicated. The apparatus is capable of analyzing sample weighing from about 0.1 to 2 grams, and the operator can run samples in 15 to 20 minutes each with an accuracy of about ± 0.001 per cent.

Quench Cracking Susceptibility Test for Hollow Cylinders

By Robert F. Mehl, director, metals research laboratory, Cyril Wells, metals research laboratory, Carnegie Institute of Technology, C. F. Sawyer, metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa., and I. Broverman, Sandia laboratory branch, Los Alamos Laboratories.

A QUENCH cracking susceptibility test developed for use in a study of factors affecting quench cracking in hollow cylinders will be described and discussed. In this test notched specimens 6.5 inches OD, 2.75 inches ID, and 0.5-inch thick are spray-quenched in a special way, and a minimum depth of notch in inches required to crack specimens is determined. This minimum, which varies inversely with cracking susceptibility, is taken as an index of cracking susceptibility.

Test is easy and cheap to make and has already been extensively employed in studies of the effect on quench cracking of (a) composition, (b) material at different positions in a forged ingot, (c) prior treatment before quenching, (d) austenitizing temperature, (e) temperature to which quenched, and (f) a prebor quench.

Preliminary data suggest the pos sibility of using the test successfully as a means of separating tubes whic should receive a special quenching treatment to prevent cracking fron those which are extremely unlikely to crack in a normal commercia quenching practice. Possible modifi cations of the test to increase it range of usefulness are indicated.

Stability of AISI Alloy Steels At Elevated Temperatures

By A. B. Wilder, chief metallurgist, National Tube Co., U. S. Steel Corp. and J. O. Light, chief metallurgist, National Tube Co.

STABILITY of more than 100 dif ferent types of steel at 900, 1050, and 1200° F (480, 565 and 650° C) i being evaluated over a period of 1 years. Welded samples are include in the investigation. The results ob tained in an examination of 16 o these steels for evidence of structur changes, oxidation characteristics an impact properties after exposure fo 10,000 hours will be presented.

Typical AISI alloy steels which ar extensively used in the automotiv industry were investigated. The steel were either normalized or annealed before exposure and, in general, tw carbon levels were investigated. Oxi dation in air at 1200° F (650° C) wa too severe to permit evaluation o the properties. Graphitization afte exposure at 900 and 1050° F (48 and 565° C) was observed in the AIS nickel and nickel-molybdenum steels but was not observed in the AIS steels containing chromium.

The chromium-vanadium an chromium-molybdenum steel were th most stable. Charpy impact proper ties at ordinary temperatures of al the AISI steels investigated were not adversely affected by exposure at the elevated temperatures.

Effect of Alloying Elements on Transformation of Heated Steels

By J. F. Libsch, consulting metallurgist Lepel High Frequency Laboratories Inc. W. P. Chuang and W. J. Murphy, Lehig University

INFLUENCE of alloying element upon the response of steels used fo induction hardening will be reported The alloying elements are classifie into two fundamental groups: Car bide-forming elements, and ferrite strengthening elements. The influenc of each group of elements upon th transformation characteristics of th austenite formed in induction heatin will be presented and discussed.

For proper selection of alloy steel to be used in induction hardening, th

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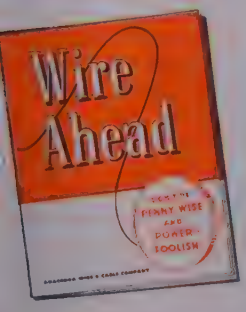

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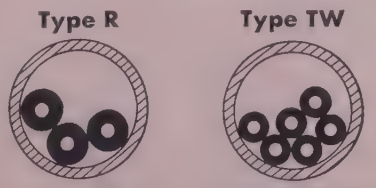

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austenitizing cycle and the nature of the alloying elements must be considered. In plain carbon steels and alloy steel containing ferrite-strengthening elements only, the austenitizing cycle is of minor importance, and the properties of the hardened and tempered steel are similar to those obtained with conventional heating. In alloy steels containing carbide-forming elements, the austenitizing cycle assumes primary importance. Austenitizing temperatures 150 to 300° F in excess of conventional hardening temperatures are required to take full advantage of these alloying elements.

These temperatures may be used in induction heating without prohibitive grain coarsening, but they will develop somewhat deeper cases in surface hardening. A significant combination of properties, involving high abrasion resistance on the one hand and an optimum balance of strength and toughness on the other, may be produced in medium carbon steels by taking advantage of an induction heating cycle wherein the alloy carbides are only partially dissolved.

Measurement of Retained Austenite in Carbon Steels

By B. L. Averbach, assistant professor, L. S. Castleman, research assistant, and M. Cohen, professor of metallurgy, Massachusetts Institute of Technology

AN x-ray method previously applied to the determination of retained austenite in tool steels has been extended to the determination of retained austenite in low and medium carbon steels. Measurable quantities of austenite are found in a series of quenched plain carbon steels (both refrigerated and nonrefrigerated) containing from 1.07 down to 0.20 per cent carbon. Below 0.50 per cent carbon, relatively little austenite transforms by refrigeration.

Unnotched Impact Strength of High Speed Steels

By Arthur H. Grobe, research metallurgist, and George A. Roberts, chief metallurgist, Vanadium-Alloys Steel Co.

UNNOTCHED Izod impact tests were conducted on nine different commercially available high speed steels and comparison of these results with the properties obtained in the band test was made for one of these steels. The steels included the standard tungsten, tungsten-molybdenum and molybdenum high speed steel types, as well as two high carbon-high vanadium and three tungsten-cobalt grades.

18-4-1 high speed steel was tested over a wide range of austenitizing temperatures, 2100 to 2400° F (1150 to 1315° C), while all other grades were tested after austenitizing at two temperatures, the higher of which was selected to represent a normal commercially employed value. 18-4-1 and 6-5-4-2 high speed steels were tested over the entire tempering temperature range from 100 to 1150° F (38 to 620° C). Other steels were tested after tempering in and beyond the range of maximum secondary hardness.

A comparison of the unnotched Izod impact strength and the bend test properties of a tungsten-molybdenum high speed steel was presented.

Tungsten-Iridium Thermocouple For Very High Temperatures

By Walter C. Troy, supervisor, and Gary Steven, research metallurgist, metals department, Armour Research Foundation

OPERATING between 1600 and 2000° C (2910 and 3630° F), calibrations were made for thermocouples representing combinations of tungsten, molybdenum, tantalum, platinum, rhodium, iridium and alloys of these metals. In a neutral atmosphere, optimum properties and performance were obtained with the tungsten/iridium thermocouple. Its features include: (a) high emf, (b) an almost linear calibration curve between 1000 and 2100° C (1830 and 3810° F), (c) negligible room temperature emf, obviating cold junction compensation, and (d) thermoelectric stability while operating at high temperatures for 120 hours in helium.

Composition Influence on Temper Brittleness in Alloy Steels

By Col. A. P. Taber and Lieut. Col. J. F. Thorlin, Ordnance Department, and J. F. Wallace, metallurgist, Watertown Arsenal Laboratory

CLOSELY controlled investigation was conducted to determine the influence on temper brittleness of various amounts of chromium, manganese, nickel, and molybdenum in low and medium alloy steels. The significant variables, such as grain size, hardness, microstructure, steelmaking practice, forging direction and reduction, tempering temperature, and method of embrittlement were maintained as constant as possible.

Results indicate that alloys investigated influence the temper embrittlement of steels slowly cooled from the temper at a rate of 18° C per hour. Chromium causes considerable increase in the susceptibility of alloy steels to temper embrittlement. In addition, the presence of chromium appears to enhance the embrittlement produced by additions of manganese and nickel. Manganese up to 0.60 to 0.70 per cent has little effect, but larger percentages of this element bring about as much or possibly more temper embrittlement than chromium. Nickel tends to develop much less susceptibility toward temper brittleness during slow cooling from the tempering temperature than either chromium or manganese. From four to five times more nickel than chromium or manganese (above 0.60 to 0.70 per cent) is required to produce the same embrittling effect. Molybdenum, at least in amounts up to 0.25 per cent, greatly decreases the susceptibility to temper embrittlement of the alloy steels investigated.

To attain maximum hardenability with the minimum temper brittleness the employment of a steel containing up to at least 0.60 to 0.70 per cent manganese and at least 0.25 per cent molybdenum appears desirable under all conditions. Combinations of manganese, chromium, and nickel seem preferable for higher hardenabilities, with some advantages attainable at high nickel contents.

Characteristics of Cast Low Chromium-Molybdenum Steels

By N. A. Ziegler, research metallurgist, W. L. Meinhart, assistant research metallurgist, and J. R. Goldsmith, metallurgical engineer in charge of research foundry, Crane Co.

A STUDY is reported of some low chromium-molybdenum cast steels recommended for their resistance to graphitization in superheated steam service. These steels consisted of five groups containing (a) 0.4, (b) 0.7, (c) 1.25, (d) 2.0, and (e) 3.0 per cent chromium with several molybdenum levels between 0.4 and 0.8 per cent and carbon contents between 0.05 and 0.30 per cent within each group. Results of the investigation of thermal characteristics microstructures, physical properties and weldability were presented.

Thermal sluggishness or hardenability of these steels is increased by the combined effect of carbon, chromium and molybdenum. However, this effect is weak unless carbon exceeds 0.16 per cent or chromium about 2 per cent in this carbon range.

Chromium, in general, increased the tensile strength, yield point and hardness, but decreased elongation, reduction of area and impact resistance in the 0.15 to 0.30 per cent carbon steels. It had only slight effect on the lower carbon steels. Molybdenum had practically no effect on room temperature properties.

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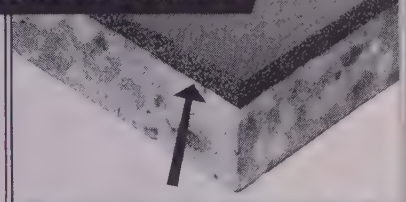

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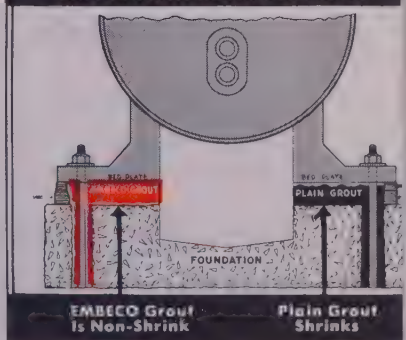

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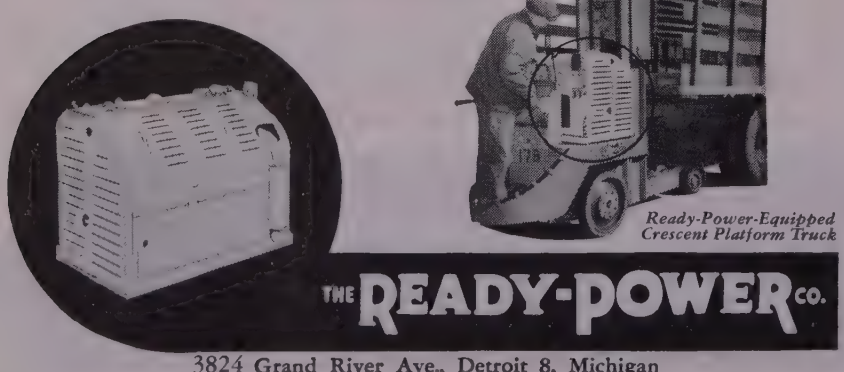

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basis of similar principles for handling rod and bar. The purpose of this machine was to extend the gas-metal research from pickling and electroplating processes into the field of hydrogen absorption from processing environments at elevated temperatures: Heat treating atmospheres, electrode coatings, vitreous enamel, steam, and so forth.

In preparation for this research a machine was built to handle bar sizes of ¼, ⅜, and ½ inch round and samples in these sizes were obtained for virtually every present commercial grade of stainless steel. Because of the informative nature of these preliminary tests themselves from the standpoint of the behavior of the stainless steels and the effects of heat treatment upon their bend values, the results of the standardizing tests are separated for discussion in this paper.

Factors Affecting Magnetic Properties of Cobalt Alloys

By J. K. Stanley, Westinghouse Electric Corp.

SOFT magnetic alloys of iron and cobalt in the range of 35 to 50 per cent cobalt are of considerable current interest for electrical apparatus because of their high magnetic saturation. Development of the alloys has been handicapped by the high cost of cobalt and brittleness in the range of high saturation.

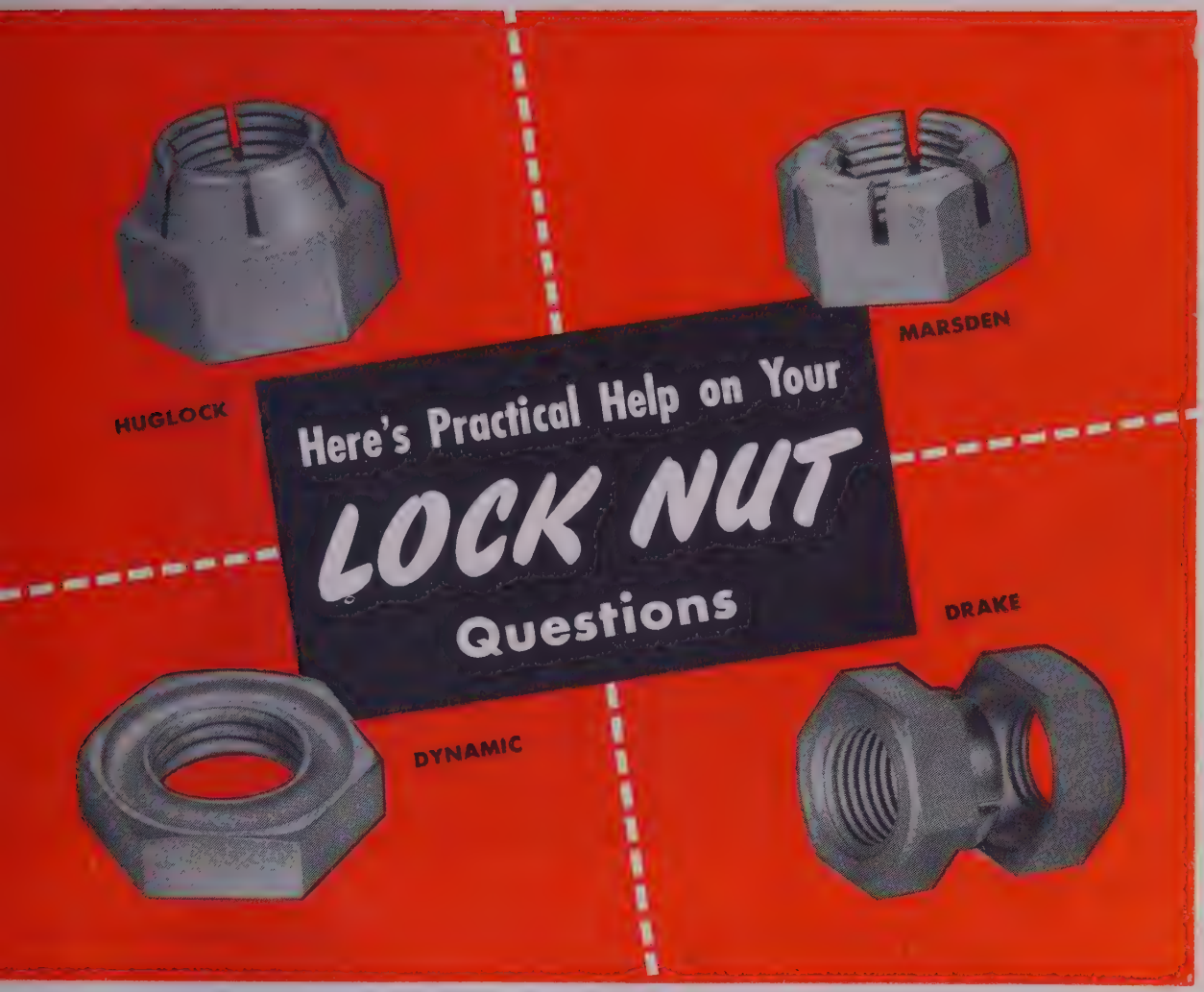
Metallurgical factors such as impurities (carbon and oxygen), grain size, and order-disorder are considered with respect to magnetic quality and fabrication of the material. Increase in impurities such as carbon and oxygen harms the magnetic quality, decreasing permeability and increasing the losses. Increasing the grain size results in somewhat improved permeability and decreased losses.

It was pointed out that the order-disorder phenomena have considerable effect on the magnetostriction, electrical resistivity and ductility of the material.

Creep and Rupture of Chromium-Nickel Austenitic Stainless

By G. V. Smith, E. J. Dulis and E. C. Houston, Research Laboratory, U. S. Steel Corp. of Delaware

FOUR 18 per cent chromium, 8 per cent nickel-type alloys were tested in creep and rupture at 1100, 1300 and 1500° F. At 1100° F the stress to produce a secondary creep rate of 0.0001 per cent per hour was greatest (27,000 psi) in grade C (columbium) and least (13,000 psi) in grade S (plain), whereas at 1500° F it was



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greatest (3200 psi) in grade M (m lybdenum) and least (850 psi) in o of the grade T (titanium) steels. T stress to produce rupture in 10 hours at 1100° F was also greate (36,000 psi) in grade C and lea (22,000 psi) in grade S, but at 150 F, grade M was strongest (7100 ps and one of the grade T steels w weakest (3800 psi).

A means, believed to be origin was found for estimating elongati or reduction of area at fracture some time beyond the range of e perimental investigation. The tec nique used is based on the discove that an "average creep rate", o tained by dividing elongation or r duction of area at rupture by ti for rupture, plots linearly again stress on log-log co-ordinates.

Examination of the fracture creep-to-rupture specimens showe in agreement with earlier work, th mode of fracture changed gradual from transgranular at relatively lo temperature and rapid strain ra (high stress) to intergranular relatively high temperature and slo strain rate. This change is associat in a general way with the change slope of the plot of log stress again log time to rupture.

—AWS—

Slope Control, its Effect on Spot and Projection Welding

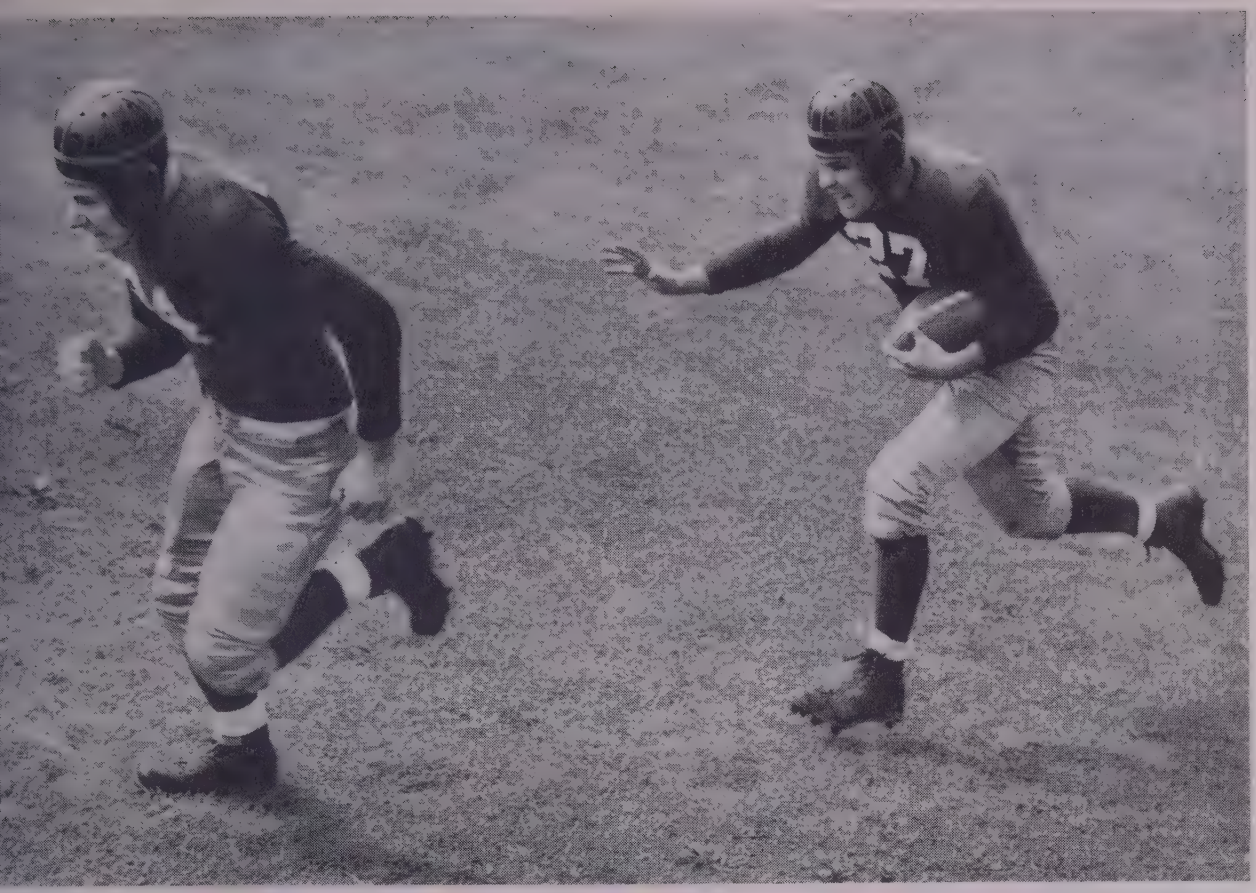
By I. W. Johnson, General Electric Co.

SLOPE control is an auxiliary co trol to any electronic resistance wel ing control utilizing phase shift he control. It permits suppression of t first cycle of current and subsequen gradual increase to welding current.

Particular attention was given electrode tip pickup in spot weldi aluminum. As illustrated by the dat the number of spots possible betwe tip cleaning is greatly increased the slope control. For instance 0.081 24ST alclad, it is possible make more than 1700 spots befo objectionable pickup occurs.

Spot welding of zinc and cadmiu plated steel has always presented serious problem from a standpoint tip pickup. If the plating is heav the pickup becomes more aggravate As the deposit on the electrod builds up it becomes increasingly di ficult to make a satisfactory wel until excessive sticking occurs. Slo control minimizes pickup, thus pe mitting more welds to be made a eliminates excessive sticking of wo to the electrodes.

Multiple projection welding of uminum has heretofore been impo



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sible or considered impractical o production. Slope control has mad it possible readily to effect sound pro jection welds on aluminum alloy The following aluminum alloys hav satisfactorily been projection welde 24ST3, 52S, and 61ST6.

Spot Welding Heavy Gage Structural Steel

By Ernest F. Nippes and R. F. Underh Jr., Rensselaer Polytechnic Institute

IT is possible satisfactorily to spo weld 1/8-inch pickled, and 3/16, 1/ 3/8 and 1/2-inch grit-blasted mil structural steel. To weld the 1/8, 3/1 and 1/4-inch materials, such that th normal tension to shear ratios excee 45 per cent, it is necessary to tempe the spot weld in the material. Tem pering can be done satisfactorily b cooling the spot weld and subsequen ly reheating to the proper tempe ing temperature by the passage o additional current while the material still between the welding electrode Recommended conditions for spo welding the five gage thicknesses o mild structural steel and for spo welding and tempering the 1/8, 3/1 and 1/4-inch thicknesses are give

In addition, it was found that th electrode-to-metal interface tem perature produced during spot weld ing of 3/8-inch grit-blasted mil structural steel is comparatively th same whether the material is spo welded acording to pulsation weldin practices or continuous welding pra tices, the total welding time in eac case being approximately the sam

Silver Alloy Brazing Stainless Steel

By C. H. Chatfield and A. W. Swit Handy & Harman

IN applying silver brazing alloys t stainless steel, extra emphasis shoul be placed on careful attention to eac of the fundamental steps of makin a silver brazed joint. Carbide precip itation cannot be avoided at the tem peratures required but may be hel within limits which do not seriousl increase susceptibility to corrosio Corrosion, when it occurs, is confine largely to the bond itself rather tha to the brazing alloy. Nickel additio to brazing alloys greatly increase r sistance of joints to chloride corr sion.

Common impression that zinc o silver may diffuse selectively fro the brazing alloy intergranularly i to stainless and cause cracking wa disproved, and cracking was show to be the result of stress-corrosio Effect of pickling, cleaning, and pa sifying procedure after brazing wa discussed. These may seriousl

reaken the joints and are the cause f many of the failures of silver razed stainless steel. Passifying reatments, particularly, should be voided wherever possible.

Magnaflux Inspection of Welded Storage Tanks

By F. A. Upson, Standard Oil Co. (Indiana)

ON the basis of experience gained uring 2 years of actual field aplication, it is believed that the magetic particle inspection method (Magnaflux) is suitable for the outine detection of injurious defects n welded tank seams of appropriate esign. The actual details of the echnique employed in any given ase will depend upon tank size, plate hickness, welding and erection proedure, seam details, and available Magnaflux equipment. Experience as shown that Magnafluxing eed not interfere with erection rogress and, when proper technique s used, it is effective in economicaly revealing the more serious defects hat might otherwise remain undisovered.

Application of Portable Resistance Welding Tools

By Charles H. Davis Jr., The Budd Co.

THIS paper covers the design of nonstandard portable resistance welding equipment. Use of this equipment s often justified when other methods f fabrication fail to meet either production requirements (speed), or the llowable cost of fabrication, or when lesign requirements prohibit the use f other methods.

Since the design of welding equipment is of a very special nature, few f the many users of this equipment re aware of more than the basic onsiderations involved. The author ndicates various methods of design o achieve the main purpose of any abricating technique, that of manuacturing asemblies more quickly and nore cheaply.

Heat Effects in Anode Spots Of High Current Arcs

By T. Benjamin Jones, Johns Hopkins University

IT is well known that total arc curent determines melting rate of elecrode metal. It is not so well recogized, however, that current density may be of equal or perhaps greater mportance in the effective utilization f energy supplied by the arc. This paper reports a study of melting ates and current densities in anode spots for direct current arcs in the

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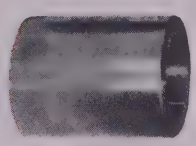

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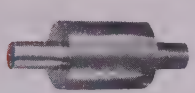

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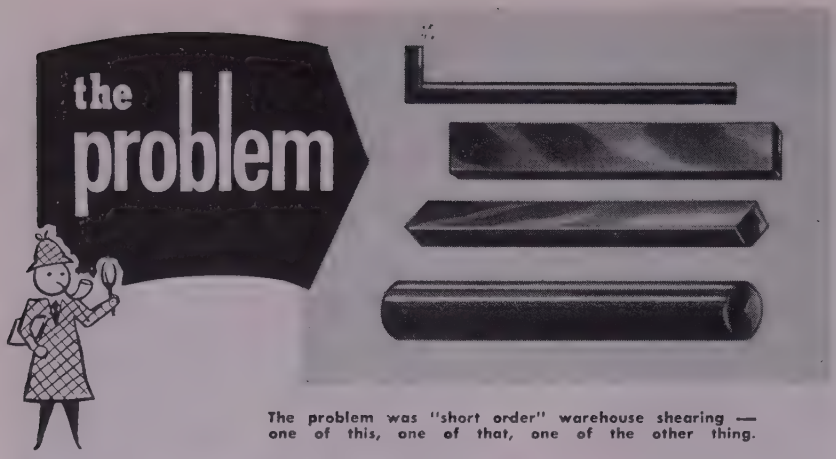

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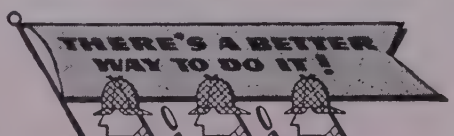

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current range of 40-200 amp. Ano spots were formed by employing high-speed moving electrode tec nique.

Current densities of 12,000 amp p square centimeter were measur with indications of even higher va ues. Both current density and mel ing rate were found to be depende on relative speed of electrodes. Th may be of significance in connectic with metal cutting and automat welding. Some correlation with th oretical heat flow equations was al obtained. The above studies were su plemented by microscopic examin tion of sections through anode spot In addition, high speed movies helpe to clarify the mechanism of th anode vapor jets and their relation t arc stability and metal transfer.

Influence of Welding Procedures, Design of Arc Welding Machines

By S. Oestreicher, Harnischfeger Corp.

COST of a given weld depends o many factors. While influence on cos of using electrodes of different size has been thoroughly explored, par of the welding machine itself ha not been discussed on a similar scop Comparisons are available showin the difference in weld and power cos of alternating and direct curren welding machines for comparable ap plications. This paper showed tha considerable differences also exis comparing the same type of weldin machines.

A smaller machine used near fu rated output will do the same wor more economically than a large welder used for the same work a correspondingly reduced outpu Welding range of roughly 20 per cen to 125 per cent of the rated outpu of a welding machine was right an economical as long as welding wa mainly a universal repair metho Now that welding has become production method, a rating close to production requirements might b advantageous.

Inert Gas Shielded Metal Arc Welding Process

By A. Muller, G. J. Gibson and E. Roper, Air Reduction Sales Co.

DEVELOPMENT of the Aircomati process for welding aluminum alloy stainless steels, aluminum bronz clad steels, magnesium alloys, etc are described. Laboratory test dat including mechanical properties an radiographic results is presente for typical welded joints in the ma terials mentioned above. Special a tention is given to the technique for producing high quality welds fo

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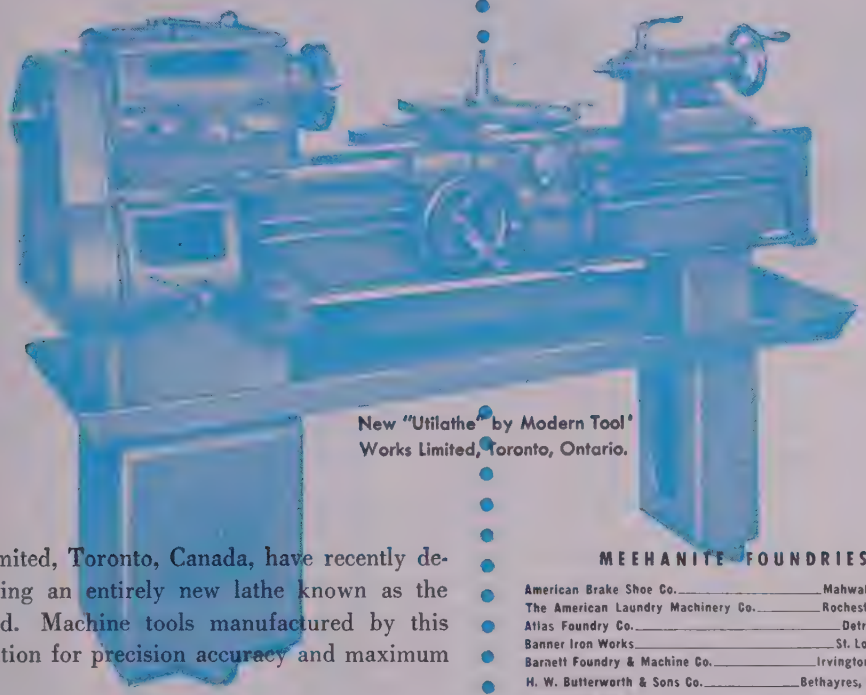

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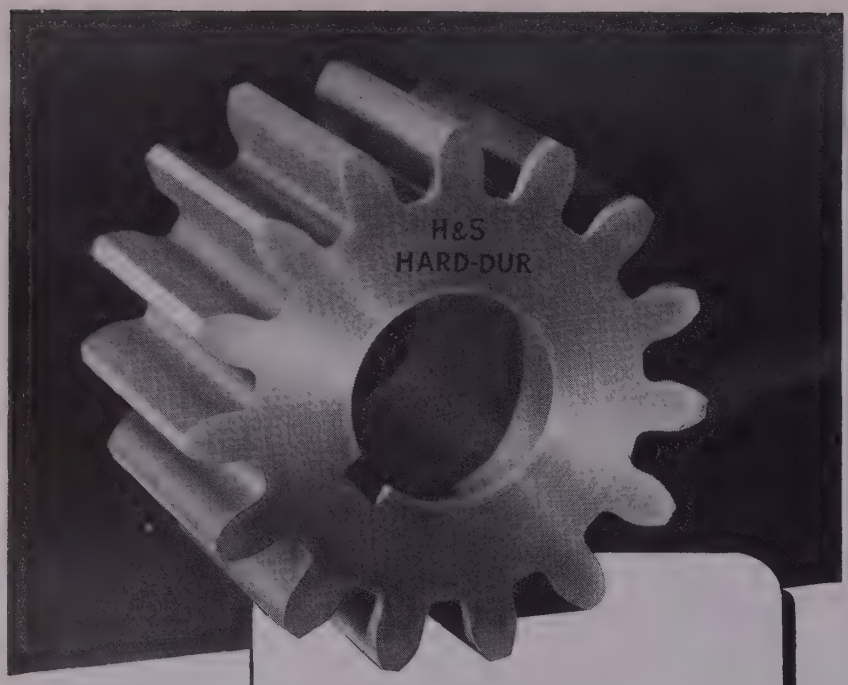

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the purpose of meeting various industrial code requirements.

In the year that industry has been using the method for welding aluminum, the process has been applied principally to heavy-walled liquid containers ranging from cubical tanks 5 x 4 x 3 feet up to storage tanks 40 feet in diameter and 50 feet high. Some large pressure vessels and heavy process piping have also been successfully fabricated. Various items of a structural nature have been built. All these have shown substantial fabrication economies as compared to similar items welded by other methods.

Inert Gas-Shielded Arc Welding Aluminum Pressure Vessels

By A. J. Hopper, Welding Engineers Inc.

THIS paper reviews some of the practical problems encountered in welding vessels with plate thicknesses from 3/16 up to 2½ inches generally of 3S aluminum alloy. Welding in all cases was accomplished with the manual inert gas-shielded arc process using argon gas.

Need of various types of weld grooves is shown in order to suit the welding process, the accessibility of welding from one or both sides, and, or the examination of the completed weld by x-ray. Preheating the parent aluminum, and holding a high temperature during welding was utilized on all heavy plate. Hold-down jigs and fixtures are found to have considerable usefulness in controlling distortion during welding.

Even the layout of aluminum plates, subsequent fit-up in assembly and tacking should follow a definite procedure that allows for the particular properties of aluminum. Its very high thermal conductivity, its relatively high coefficient of expansion, and its low melting point must be recognized and allowances made in all stages of fabrication.

Notch Sensitivity of Mild Steel Plates

By A. B. Bagsar, Sun Oil Co.

NOTCH sensitivity, low temperature properties and transition temperatures of steel plates of structural and pressure vessel qualities were determined by tensile, bend, tensile-bend, and standard Charpy and special impact tests. Steel plates tested cover thickness range of ¼ to 2¼ inches inclusive. Effects of heat treatment, cold work, aging, notch geometry and other variables were investigated. The breaking and yield loads were determined cinematographically.

A definite correlation was found be-

veen foregoing tests, especially in ie determination of transition tem- eratures, and in evaluation of gen- al behaviorism of "as rolled" steels atmospheric and subatmospheric mperatures. On the basis of these ata, simplified testing procedures re discussed for establishing notch nsitivity, transition temperatures nd other characteristics of steel ates intended for all-welded con- ruction of monolithic type.

utomatic Electric ard Facing

By Turner G. Brashear Jr., Leader Welding & Mfg. Co.

VELDING by the oxyacetylene and lectric arc has played an important art in maintenance of equipment in arious industrial fields subjected to mpact and abrasion. Three processes re new in the field of automatic ard facing but through recent de- elopments have been called into use n an increasing scale. These are ie submerged arc whereby the nec- ssary hardening alloys are intro- uced in the flux in conjunction with mild steel rod, or are in the coat- ng of a spiroly round automatic lectrode now produced by two ma- or welding supply manufacturers or y the use of fabricated hollow rod r a solid alloyed rod.

All three methods of introducing wear resistant surface via auto- natic welding are used in combina- ion with various types of submerged nelt fluxes. Two distinctly new meth- ds of controlling bend contour by he use of carbon sticks and water- ooled tungsten electrodes in con- unction with submerged melt weld- ng will also be covered. A method f utilizing two automatic feeds on ne head and thereby doubling an op- rator's efficiency was also covered, ogether with various methods of re- uilding and hard facing odd shaped arts via semiautomatic applications.

Hot Hardness of Hard Facing Alloys

By Howard S. Avery, American Brake Shoe Co.

HOT hardness, which is of interest hiefly because of the implied hot vear resistance, has been surveyed at 00, 800, 1000 and 1200° F for a umber of hard facing alloys, using Rockwell diamond indentor tech- ique. Some indication of creep re- istance, which becomes important s a variable at the higher tempera- ures, is obtained by incorporating a ime factor in the test.

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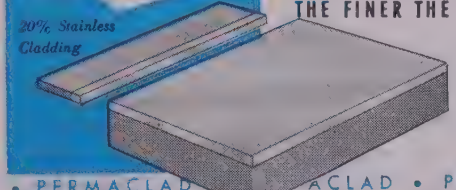

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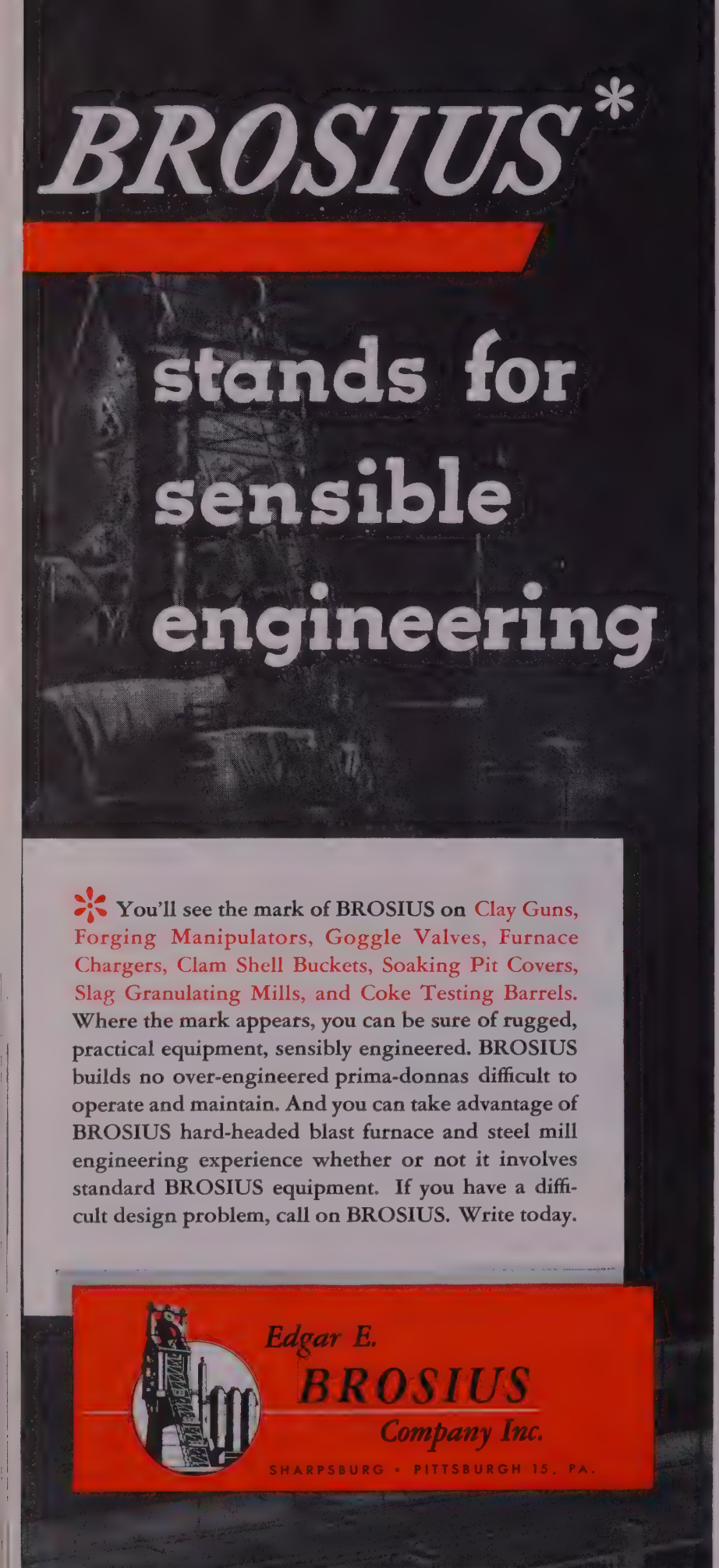

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of hard compounds (chiefly carbides) all influence hot hardness. Low alloy steels with little resistance to tempering lose hardness rapidly. Alloys such as chromium, tungsten and molybdenum, which cause marked secondary hardening, contribute to good hardness retention up through 1000° F. At 1200° F, solid solution hot strength and primary carbides appear of major importance. The Cr-Co-W alloys generally exceed the other alloys in hardness at 1200° F but their properties vary widely with carbon content. Since toughness, as indicated by compression tests, varies inversely with carbon content, a compromise between hardness and toughness is required.

Hard-Facing Applications In the Steel Industry

By J. J. Barry, Air Reduction Sales Co.

DISCUSSION of the factors affecting choice of the hard facing alloy can be stated in two simple rules: 1. Evaluate properly the actual service conditions. 2. Know the properties of the several groups of hard facing alloys and select the alloy which will be best suited for the application.

True picture of advantages of hard facing is not always obtained since the benefits in terms of extended service, efficiency, and economies is not always obtained, either because of misapplication of the overlay material or because the correct welding process is not used. Principles described are representative of most problems, and the methods used apply to other buildup and hard facing operations of similar nature.

Arc Welding Molybdenum

By I. S. Goodman, Westinghouse Electric Corp.

AS THE technique of producing pure molybdenum in a greater variety of shapes and sizes has improved, and as the requirements for high temperature alloys may increase, a corresponding demand has appeared for better methods of joining molybdenum. Thin sections may be resistance welded or brazed with ease. For heavier sections, the resistance welding power demand is too high to be practical and brazed joints do not possess temperature and/or corrosion resistance for many applications. Arc welding appears to be the only nonmechanical method for joining large or thick molybdenum sections so that the joint has comparable properties to the base metal.

Data will be presented and discussed along with photomicrographs which indicate that submerged arc (or melt) welding offers the best po-

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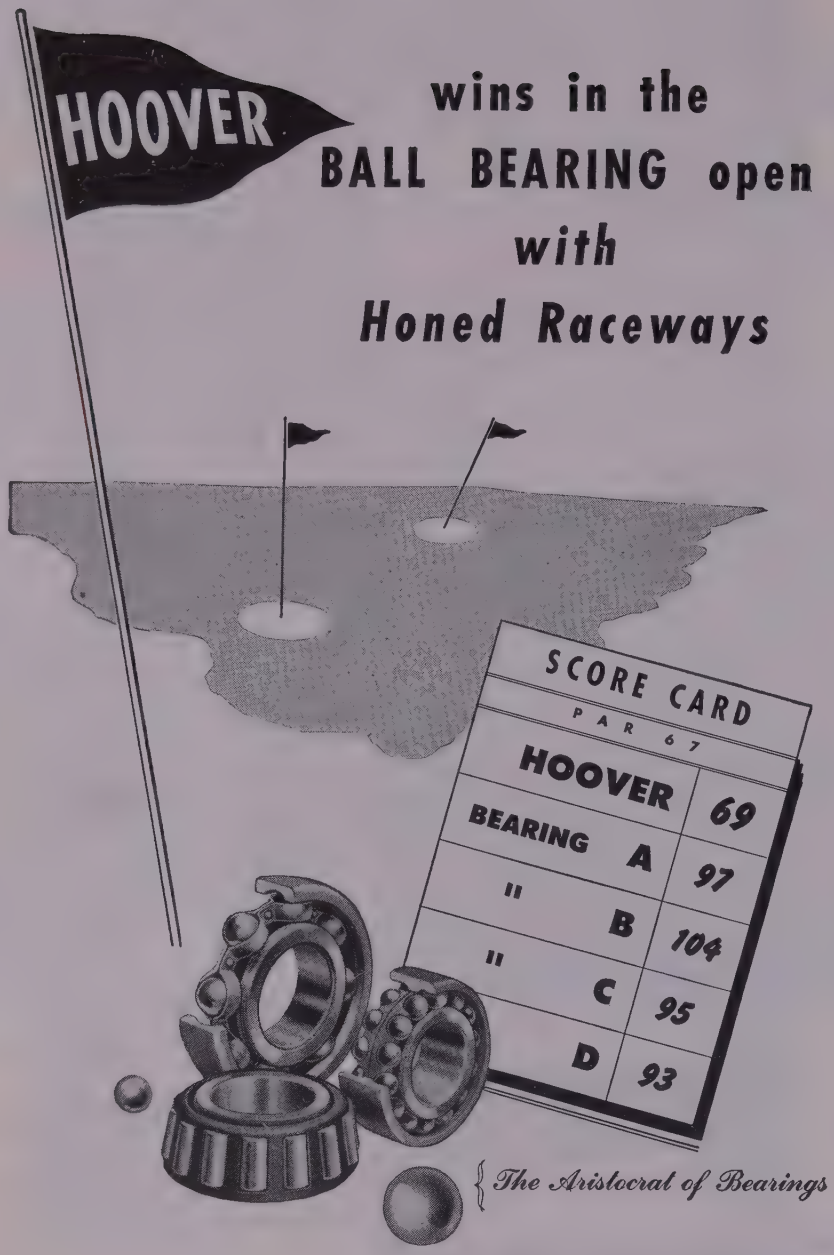

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tentialities for sound joints. Inert arc gas welding and atomic hydrogen welding are discussed briefly since present techniques limit their use to sections less than ¼-inch thick. Manual arc welding does not appear feasible.

Welding High Nickel Alloys to Other Metals

By G. R. Pease and H. B. Bott, International Nickel Co. Inc.

WITH increasing frequency, service conditions require the production of strong, ductile joints between two metals of widely different composition. Experience has indicated, however, that in making such joints there may be complicating factors which are not common to the welding of either metal alone. In line with the need for this type of information a group of metallic-arc welded butt joints was prepared and examined for strength, ductility and weld soundness. Strength and soundness were evaluated by conventional methods but, to obtain meaningful ductility values, it was necessary to bend the weld longitudinally.

Test joints numbered over sixty and included welds joining Monel, Inconel and commercial nickel to each other and to several other engineering alloys. This latter group included mild steel, 18-8 stainless steel in four composition ranges, 70-30 cupro nickel, silicon bronze and Hastelloy B. Results indicated, in general, that the safest choice for welding joints of the type investigated is the electrode which matches the composition of the high nickel alloy involved. Where two high nickel alloys are involved, either matching electrode has been found to be satisfactory.

Brittle Failure and Size Effect in a Mild Steel

By K. J. Stodden and E. P. Klier, Pennsylvania State College

IT HAS been generally accepted that the physical properties of mild steels are highly affected by the size of the test specimen. Thus with reference to the inception of brittle failure, it is believed that for increasing specimen size the temperature is increased at which brittle failure may be encountered. Assuming the validity of this interpretation of size effect, it is evidently very difficult to rationalize, for instance, service behavior of a mild steel with small scale test results.

It was shown that under certain experimental conditions the phenomenon of size effect can be sensibly eliminated as it pertains to the ap-

pearance of brittle failure. Specimen sizes studied ranged from the 10 x 10 mm. Charpy bar to a 1¼ x 1¼ inch bar tested in slow bending. For these specimen sizes the transition temperature for a mild steel was invarient.

Seam Welding Monel Metal to Steel

By Ernest F. Nippes, Allan R. Pfluger and Gerald M. Slaughter, Rensselaer Polytechnic Institute

STUDY was made of resistance seam welding of Monel to low-carbon steel in the 0.062-inch gage. It was found that for the weld times investigated, fusion of both the Monel and steel resulted in a heterogeneous weld nugget and led to porosity and cracking in the weld zone. To avoid the above porosity and cracking, seam welds of Monel to steel were made with fusion occurring only in the Monel. The optimum conditions for producing these "braze" type welds were established. Strengths of welds made by this method exceeded those of seam welds of steel to steel. The pillow test was found to be a valuable aid in determining strength and pressure-tightness of seam welds.

Factors Affecting Quality of Production Flash Welding

By E. A. Sirabian, Arnold, Schwinn & Co.

HIGH levels of production involving flash welded joints have been reached and maintained at the plant of the Arnold, Schwinn & Co., Chicago. For example, some 8,600,000 flash welded joints were made in the bicycles and accessory parts produced during 1948. To attain and hold this record production machines were made fully automatic and suitably safeguarded. The fixtures are simple in design and heavily built.

Accurate timing of current cutoff with respect to application of upset pressure is essential to weld strength. Inclusions, cracks and porosity lower joint strength. Check on timing in the past has been maintained satisfactorily in the conventional manner. However, an instrument on which could be recorded energy input, timing of current cutoff and amount of upset pressure reached, would no doubt serve as a more accurate and time saving check on weld quality. Maintenance of close alignment is possible through provision for jaw adjustment horizontally, vertically and for width of contour. Jaws are all water-cooled, and in some cases, equipped with air blast for cleaning jaw surfaces of flash particles.

At points of maximum wear, jaws have been provided with replaceable

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big reductions in costs where opportunities for substantial

SAVINGS

are greatest . . . in the incredibly rich field of materials handling.

For the quick, sure way to achieve them,

*LOOK to the fast, sturdy, low-cost machines produced by

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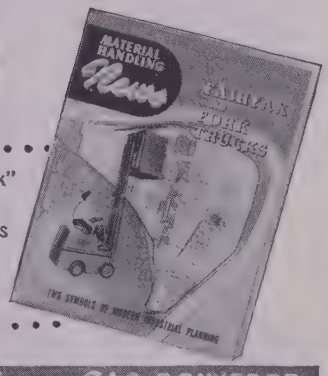

How several foremost industries have "looked to Clark" —with quick and substantial profit to themselves— is described and illustrated in Material Handling News and in Clark's exceedingly helpful motion pictures. You can enjoy the benefits of these by requesting them on your business letterhead.

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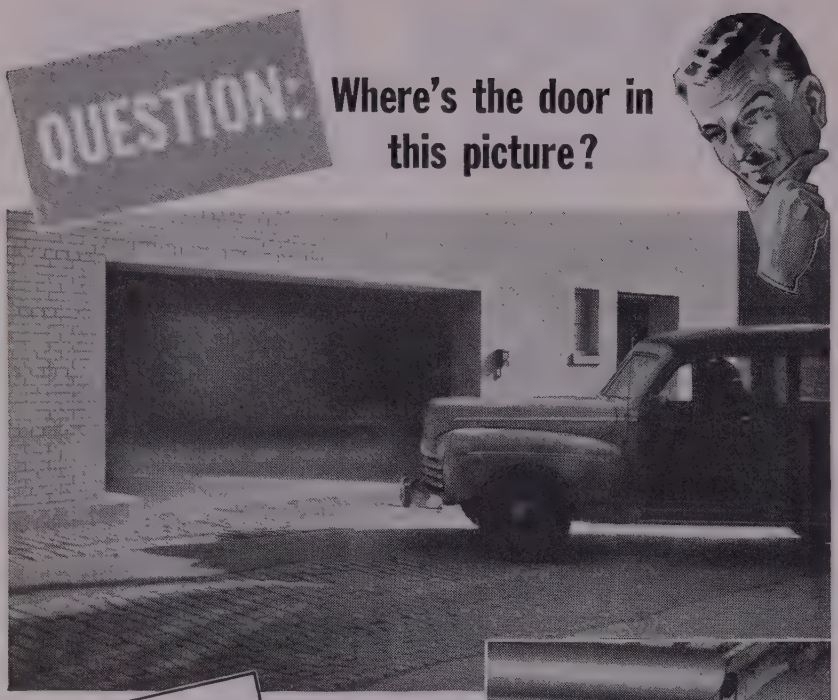
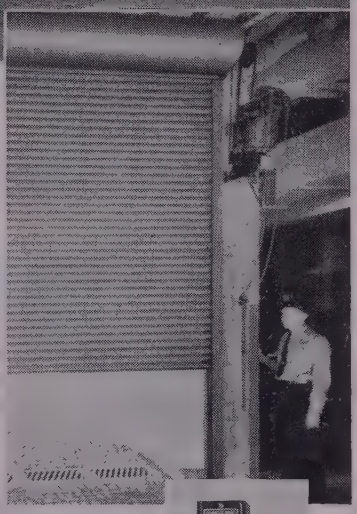
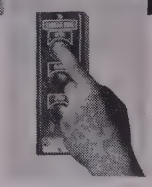
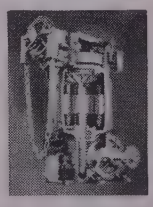
QUESTION: Where's the door in this picture?



ANSWER: It's in the doorway alright, but you can't see it—because it's coiled compactly above the lintel! That's where KINNEAR STEEL ROLLING DOORS **always are when open**—completely out of the way. And they can't obstruct floor or wall space around opening, either. Even the overhead area is clear for conveyor or monorail as well as sprinkler piping, etc. These strong, Kinnear-originated curtains of interlocking steel slats give extra protection against fire and intrusion, plus "bonus years" of carefree door service. Built to fit any openings in old or new structures. Motor or manual control.







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For added convenience and plant economy, KINNEAR STEEL ROLLING DOORS are available with the rugged Kinnear Motor Operator at right which is actuated from the push button panel at left. The control button can be placed anywhere within or outside the building, or several control switches can be strategically located for handiest remote control operation.

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THE KINNEAR MANUFACTURING CO.

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inserts of suitably wear-resistant material. A regular schedule of inspection and maintenance of machines and fixtures, together with the electrical and air systems has been found necessary to keep up weld quality and alignment.

Study of Navy Tear Test

By Noah A. Kahn and Emil A. Imbembo, New York Naval Shipyard

THIS paper presents data obtained in a further study of the Navy tear test as applied to current production heats of medium and high-tensile steel plate. In the medium steel group were included material rolled to Navy specifications and the American Bureau of Shipping rules in thicknesses of ½ to 1½-inch and in the "as-rolled" and normalized conditions. A number of silicon-killed medium steel heats were also included. In the high-tensile group are included Navy "vanity-type" steels (yield strength 50,000 psi min.) in thicknesses of ⅝ to 1¼ inches and in the "as-rolled" and normalized conditions. The paper also discussed effect of chemistry, plate thickness, grain size and heat treatment of the relative notch-sensitivity characteristics of the materials investigated.

Material Consumption Rates on Flash Welding Characteristics

By William N. Platte, Westinghouse Electric Corp.

EFFECT upon the flash welding process has been studied by using a number of fixed consumption rates and determining minimum voltage and corresponding current required to maintain flashing. Definite relationships were shown to exist between rate of material consumption, flashing voltage and current. Temperature measurements demonstrate the relationship between work temperature, material consumption rate, flashing voltage and current. Using these relationships an optimum flashing rate has been found and used to establish flash welding schedules.

Homopolar Generator System For Resistance Welding

By Thomas J. Crawford, Progressive Welder Co.

THIS progress report on the development of the homopolar generator stored-energy system of power supply for resistance welding describes technical improvements in equipment and the development of accessory equipment intended to meet specialized welding needs. A discussion of economic factors is included.

Newer generator designs intended

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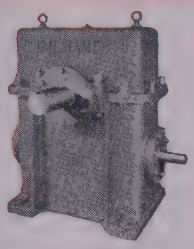
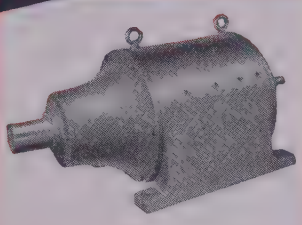
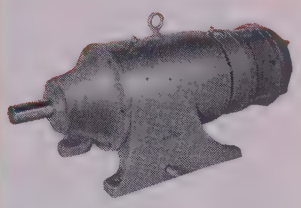
Single, Double, Triple Reduction



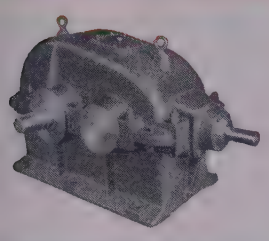
Type "H" Worm Gear



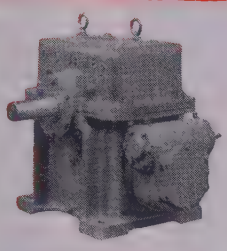
Straight Line Gear Reducer



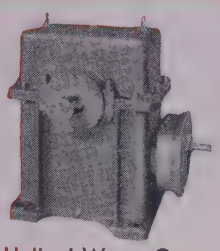
Motorized Reducers



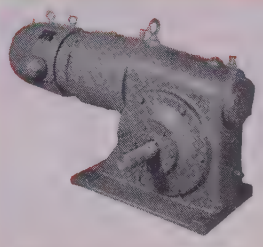
Spiral Bevel Herringbone



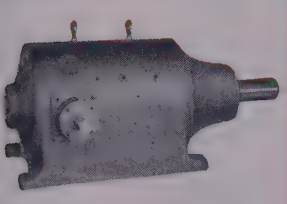
Double Worm Gear



Helical Worm Gear



Motorized Worm Gear



Right Angle Gear Reducer

Spiral Bevel Gear

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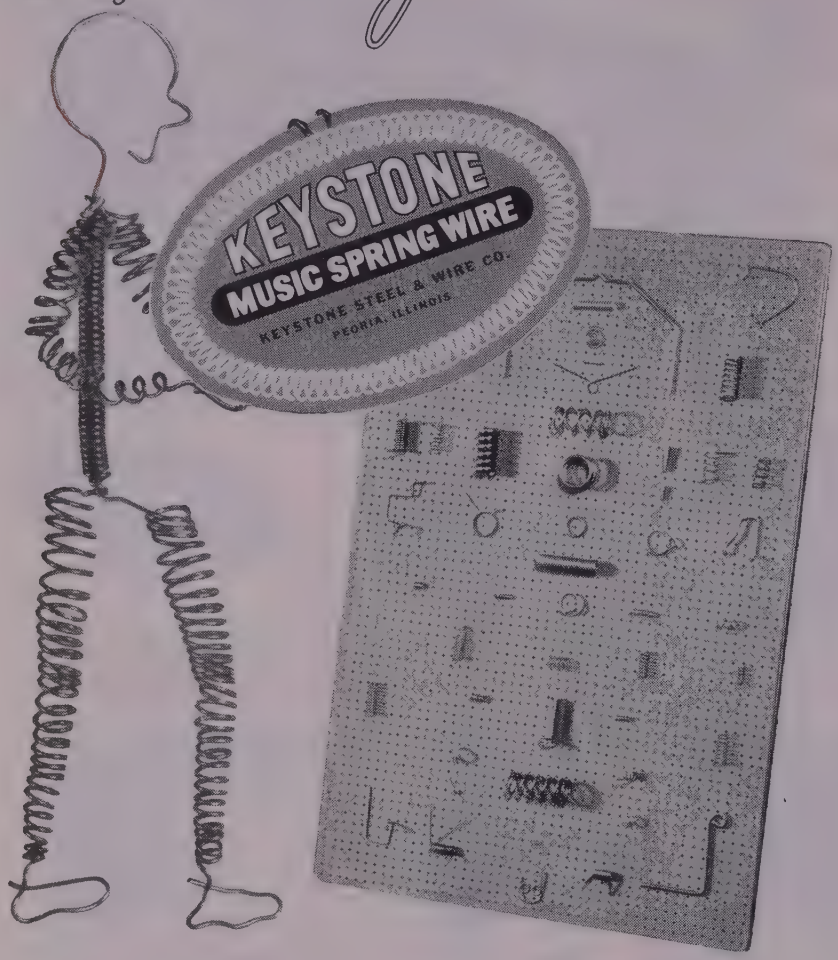

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to reduce costs are described and design limitations so far encountered are discussed. Means for adjusting and controlling rate of rise of current for spot and projection welding has been developed and is reviewed together with experimental welding results. Evidence is presented to show that the system equals in performance, weld quality, and consistency any of the contemporary welding power systems and entails a low demand typical of a true energy storage system. Designs made for engine-powered field installations rated up to 150,000 amp seem entirely feasible.

Circuit Analysis of Frequency Converter Welders

By W. K. Boice, General Electric Co.

THREE-phase frequency changer welders draw 3-phase power with less kilovolt-ampere demand and better power factor than comparable conventional single-phase welders. Line current harmonics produced by frequency-changer welders do not appreciably affect root mean square voltage drop. The line voltage drop can be calculated by simple methods presented in the paper, based on established practice for power rectifiers. Welding currents can also be predicted by methods presented in the paper.

Formulas are included in the paper to permit welder and control designs which make economical use of material, and which avoid difficulties arising from excessive magnetizing currents, from ignitron arc-backs, or from commutation faults. Test data are presented substantiating the methods of calculation offered.

Spotweld Consistency Studies

By Julius Heuschkel, Westinghouse Research Labs.

SOLUTION to the problem of consistently producing spotwelds of uniform quality is one of applying existing knowledge together with adequate visual instrumentation to warn the operator if or when the basic variables are about to go outside the permissible pre-established and proof tested limits. This procedure is shown to be superior to conventional quality control procedures since it will detect off-schedule welding before such results are reflected on the quality control chart. Also this is achieved before poor welds are made and without incurring the additional expense of extensive routine testing procedures.

It is shown for stainless and carbon steels that while the strongest welds are not necessarily most con-

sistent in their strength, welds having the least strength variations are also nearly as strong as can be achieved with the particular variable involved. The predetermination of both the strength and consistency pattern provides operating limits within which the welds must be made.

Weldment Design and Engineering Practice.

By Anthony K. Pandjiris, Pandjiris Weldment Co.

ELEVEN rules are offered as a nucleus for formulating better engineering, planning and designing: (1) Loads imposed, (a) direction (b) magnitude; (2) service; (3) application dimensions; (4) stress calculations (a) welds at low stress area (b) calculation by stress analysis of weld size; (5) picturing; (6) consideration of price and appearance; (7) shop tools; (8) stress relieving; (9) shop consultation; (10) mechanical drawing, (a) overall design assembly, (b) breakdown, (c) absence of "crutch" agencies, pattern shop, tooling, etc.; (11) follow through in shop.

Every effort must be expended by all welding personnel whether it be administration or shop to perfect and expand design.

Cutting Maintenance Costs with Aluminum Bronze Electrodes

By Jos. A. Cunningham, J. A. Cunningham Equipment Inc.

WHEN metal-to-metal wear is involved, hard grades of aluminum bronze (160 to 180 Brinell) provide low friction, nonseizing surfaces that wear well against mating steel parts. Aluminum bronze melts at 1950° F, 700° less than steel. Hence it can be applied rapidly and without materially affecting the heat treatment in the parent metal. Deposits are smooth and no craters are left. Worn gear teeth, large and small, can be rebuilt without subsequent machining. Shafting, pulley sheaves, slides and guides and other applications require machining. Deposits wear well because of the dissimilar metal effect. Savings in rebuilding are often two-thirds the cost of new parts.

Softer grade of aluminum bronze No. 10 successfully welds worn parts because it has a very high tensile strength (78,000 to 91,000 psi), excellent ductility (20-27 per cent), and comparatively low yield (37-43,000 psi). It fuses well to all types of steel including high carbon, tool steel and cast iron. Low yield permits the bronze to give where high residual stresses are involved and prevents the weld metal from pulling away at or near the fusion zone.

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When you need a combination of strength and resistance to most acids, alkalies or other corrosive substances, use stainless steel.

When you require stainless steel cap or set screws, your Allen Distributor has *the most complete line* . . . over seventy sizes that are standard.

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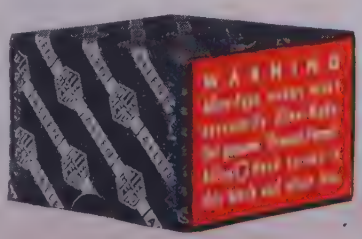
Set Screws in popular sizes from No. 6, 3/16" length to 1/2" x 3/4". Cup points.
Cap Screws in popular sizes from No. 8, 3/16" length under head, to 1/2" x 2" under head. Other threads, points and types of stainless steel available on special order.



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Bobby Pins	Curtain Springs	Link Fabrics	Special Springs
Bonnets	Drapery Pin	Lock Springs	Spiral Binding
Bookbinders	Fish Hook	Mattresses	Stapling
Bottlecap	Fish Tape	Needle	Stitching
Box Stitching	Florist	Picture Cord	Umbrella
Brooms	Fuse	Pins-Ropes	Valve Spring
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Button	Grape Tying	Piston Ring	Wire Cloth
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FOSTORIA, OHIO — ESTABLISHED 1905
REPRESENTATIVES AND WAREHOUSES IN ALL PRINCIPAL CITIES

Products and Personnel

(*Continued from Page* 135)

from nickel-copper ores, displayed featuring economies of utilizing alloys containing nickel

Invincible Vacuum Cleaner Mfg. Co. 2520

Dover, O.

To Exhibit—*7½ hp portable vacuum cleaner, powered by a combustion engine, flux recovery equipment, industrial vacuum cleaners

Representatives—R. H. Liessman, general manager; M. J. Myers, Cleveland district manager; R. B. Conklin, Buffalo district manager; W. W. Wallace, Akron-Youngstown district manager; L. M. Thomas, director of sales

Jensen Specialties Inc. 2325

Detroit, Mich.

To Exhibit—Model dual-heat infrared oven, loop-around conveyor

Representatives—F. V. Jensen, president; J. E. Sump, secretary; Burtron Zook, sales engineer; Paul Goodell, electrical engineer

J. W. Kelley Co. 1601

Cleveland, O.

To Exhibit—*Kelcut No. 20 soluble oil, *Beacon K-9 quenching oil, Kelco hydraulic brake fluid

Representatives—Frank M. Aldridge, president; R. W. Chamberlin, vice president; George Foley, Numan Squire, Don A. Graybill, sales engineers

Kux Machine Co. 1020

Chicago, Ill.

To Exhibit—*Model HP-35 cold chamber die casting machine for aluminum, brass, and magnesium

Representatives—James J. Kux, George Kux, L. W. Mann, Robert Kaufman, C. Bieniasz, S. M. Boyd

Laboratory Equipment Corp. ... 2773

St. Joseph, Mich.

To Exhibit—*Gaseous calorimeter which determines calorific power of gases within 12 minutes, semiautomatic carbon determinator for 3-minute analyses of steel and cast iron

Representatives—C. E. Schultz, president; J. A. Sauer, secretary, G. J. Krasl, vice president; O. C. Schultz, treasurer; H. J. Schmitt, manager, technical sales department; O. R. Siewert, field engineer; W. O. McKnight, business manager

Lake City Malleable Co. 2338

Cleveland, O.

To Exhibit—Samples of malleable castings in motor coach exhibit

Leeds & Northrup Co. 1409

Philadelphia, Pa.

To Exhibit—Duration-adjusting type control and Electromax controller, automatic control systems in operating demonstrations, working model of Homocarb furnaces for gas carburizing and cyaniding, Speedomax pneumatic controller, multiple point Micromax and Speedomax pyrometers, furnace pressure controllers, full metering air-fuel ratio controller, factory assembled panel equipment for automatic pH control, thermocouples and Rayotubes, radiation pyrometer elements, moistureproof pH electrodes and assemblies, portable checking instruments

Representatives—A. E. Tarr, manager, industrial sales; G. C. Graf, manager, market extension, T. C. Smith, F. L. Spangler, market extension; H. R. Abey, manager, Philadelphia office; H. S. Vecella, manager, Pittsburgh office; A. F. Moranty, manager, Cleveland office; T. D. Fulton, T. D. Bradley, E. A. Yeo Jr., F. D. Burnett, D. T. Moon, W. H. Oldbach, A. H. Albertson Jr., W. M. Albright, E. L. Weaver, A. C. McGraw, E. I. Hope, H. F. Coyle, field engineers; K. W. Conners, advertising manager; E. R. Fiske Jr., R. J. Casler, Advertising Division

Lewis Machine Co. 831

Cleveland, O.

To Exhibit—Special No. 2-C short-cut wire straightening and cutting machine, No. 3-F travel-cut machine with flying shear type cut-off, working model of ½-inch machine

Representatives—M. W. Lewis, president; F.

for the big job
...or the small

there's an SKF pillow block for every application

SKF Spherical Roller Bearing Pillow Blocks, in a wide range of standard sizes, are designed for bearing protection under various loads and speeds.

In industrial and marine equipment of all kinds, they keep SKF Bearings rolling smoothly, continuously and economically . . . seal the bearings against dust, scale and water . . . send maintenance costs 'way down.

To insure long trouble-free operation, specify SKF Bearings by ordering SKF Pillow Blocks to match. SKF Industries, Inc., Philadelphia 32, Pa.

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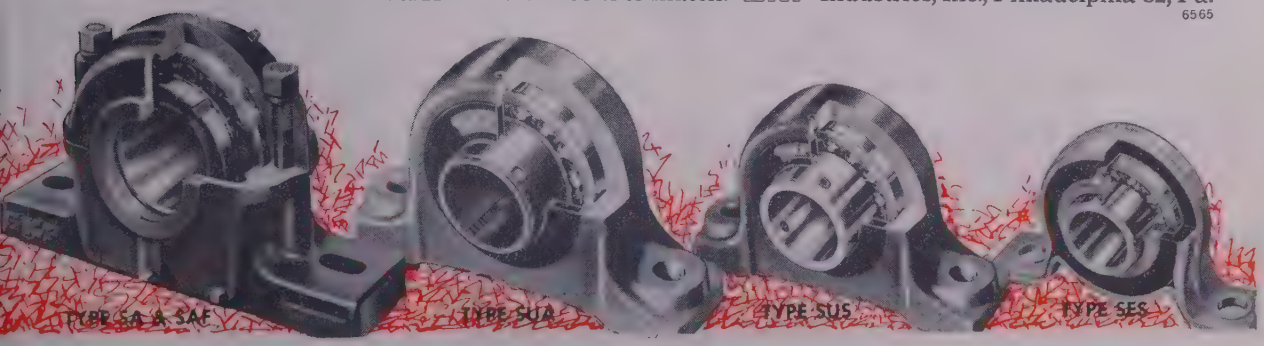

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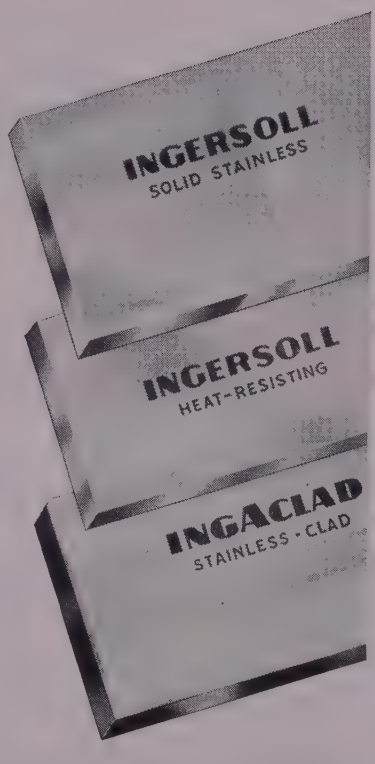
- **STEELS that *RESIST HEAT***
- **STEELS for lower cost *STAINLESS PROTECTION***



So when you need solid stainless, heat-resisting alloy steel, or IngAclad stainless-clad steel—write, wire or phone. Our advisory service is yours for the asking without cost or obligation.

INGERSOLL STEEL DIVISION, Borg-Warner Corporation
310 South Michigan Avenue • Chicago 4, Illinois
Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan

J. Rybak, general manager; C. B. Jone western sales representative; G. H. Soh central sales representative; George M. Hess doerfer, eastern sales representative; M Samuel, Canadian sales representative

Chas. F. L'Hommedieu & Sons Co. 212
Chicago, Ill.

To Exhibit—*Reliance backstand idler, *mo torized lathe speed control, *Nuway buf (of bias type buff), *sisal buffs, *extrude compositions in Tripoli, Nuwhite, stainles steel, etc. (in various shapes and lengths) generator, variable speed polishing lathes horizontal, oblique and portable plating bar rels, single break Reliance rheostats, molde compositions in Tripoli, Nuwhite, stainles steel, etc., buffs, brushes, chemicals

Representatives—Arthur W. L'Hommedieu president; J. Earl Brown, Lester Davis, Chi cago; John H. Rogers, Cleveland

Lindberg Engineering Co. 1509
Chicago, Ill.

To Exhibit—*Demonstration of results o new process for bright hardening of hig speed steels

Linde Air Products Co. 1926
New York, N. Y.

To Exhibit—*Mechanized argon-shielded met al-arc welding process demonstration, Union melt welding equipment, powder-cutting dis play, Heliarc welding demonstration, flam hardening, low temperature stress relieving expansion fitting displays, various othe types of equipment

Lipe-Rollway Corp. 1109
Syracuse, N. Y.

To Exhibit—Hand-I-Hack portable hack sav machine in actual operation

Representatives—E. S. Mariotte, sales man ager, machine specialties; R. D. Spier

Lukens Steel Co. 503
Coatesville, Pa.

To Exhibit—Actual heat, twist and quench test demonstrations on clad steels to show bond permanence, clad steel plate polishing display of welding sequence for clad steels line of nickel, stainless, Inconel and Monel clad steels, examples of flame-cut, sheared bent, pressed and blanked parts produced by By-Products Steel Co. division, jacketed stee drier roll and labyrinth steam platen

Magnaflux Corp. 1015
Chicago, Ill.

To Exhibit—Large automatic high produc tion inspection unit incorporating MAL- Magnaflux and Magnaglo units, Zyglo fo testing nonmagnetic metal parts, Statiflux for porcelain enamel and similar products Partek for porous products such as powde metallurgy compacts and unfired ceramics Sonizon ultrasonic testing, all in operation

Master Builders Co. 1765
Cleveland, O.

To Exhibit—Abrasion testing machine dem onstrating wearability of Masterplate iron clad concrete floor with armored surface ½- inch thick, nonshrink Embeco equipment grout

Representative—B. R. Wood, industrial sales manager

Merrill Brothers 1771
New York, N. Y.

To Exhibit—*Drum tilter, *Clamp for lifting polished sheets or glass, both drop forged special drop forgings made to customers' specifications

Representatives—Howard L. Franks, director of sales; William Sickles, factory representative; C. B. Lawrence, W. H. Bucholtz, Clifford Loss, George A. Allen, J. C. Lawrence, Gordon Bisdorf, Robert Derby, representatives

Metal & Thermit Corp. 1935
New York, N. Y.

To Exhibit—*Alternating current transformers for manual welding with capacities from 160 to 500 amp, *inert arc welders with capacities of 200, 400 and 800 amp, direct current motor-generator sets with capacities from 150 to 400 amp, gas engine-driven direct current sets with capacities of 200, 300 and 400 amp, Murex welding electrodes, welding accessories, Thermit welding process

Representatives—Frank J. O'Brien, president; John B. Tinnon, vice president; O. L. Howland, sales manager, Welding Division; William C. Cuntz, assistant sales manager, Welding Division; O. T. Barnett, district

manager, Pittsburgh; R. T. Brown, district manager, Newark; M. L. Smith, assistant sales manager

Miller Electric Mfg. Co. 2526
Appleton, Wis.

To Exhibit—*Model MSW toggle action tong lever spot welder, *portable 10kva spot welder, other Miller welders

Representatives—Niels C. Miller, president; H. J. Howey, vice president in charge of sales; J. V. Murray, advertising manager; A. C. Mulder, plant manager

Miskella Infra-Red Co. 814
Cleveland, O.

To Exhibit—Spira-Veyor, Moto-Baker and Porta-Flexer ovens and appliances for baking and drying

Moto-Truc Co. 2208
Cleveland, O.

To Exhibit—*18-volt counterbalance truck of 2500 pounds capacity with 94-inch fork lift and 48-inch load length, *18-volt platform truck of 10,000 pounds capacity for handling skids and core racks, *high lift crane truck for removing bearings from rolling mill rolls, *truck for handling rubber rolls from horizontal to vertical position by pushbutton control, 12-volt line of platform, pallet, high lift and trailer trucks

Representatives—I. F. Schreck, president; E. L. Beisel, vice president; Robert Heiser, assistant sales manager, Paul Schreck, superintendent

National Bearing Division, American Brake Shoe Co. . 325
St. Louis, Mo.

To Exhibit—Blast furnace castings, screwdown nuts and gears for steel mills, diesel engine bearings, bronze bar stock and babbitt metal, miscellaneous industrial bearings and castings

Representatives — R. W. Batchelder, vice president in charge of sales; J. J. Nelson, Eastern sales manager; L. E. Hoyer, Cleveland sales manager; R. E. Lottes, Cleveland sales representative; T. J. Dempsey, E. C. Buerkle, Pittsburgh sales representatives

National Diamond Laboratory . 2707
New York, N. Y.

To Exhibit—*Machine designed to hot press metal powders, industrial diamonds which retain tight setting due to hot press powder metal bond

Representatives—Harry L. Strauss Sr.; Harry L. Strauss Jr., technical director; E. Cerf Despers; Peter Shore, works manager

North American Philips Co. 832
Mt. Vernon, N. Y.

To Exhibit—High angle Gieger counter x-ray spectrometer

Representatives—C. J. Woods, sales manager, Research and Control Instruments Division; J. S. Buhler, engineer; F. Behr, application engineer

Nakite Products Inc. 2565
New York, N. Y.

To Exhibit—*Composition No. 38 fume-seal material for pickling solutions

Representatives—T. R. Smith, Detroit Division manager; F. H. Breuning, Cleveland Division manager; J. H. Banta, A. W. Horst, M. B. McClain, J. T. McQuillin, R. B. Potter, M. R. Stevens, J. H. Timmins, technical service representatives

Osborn Mfg. Co. 817
Cleveland, O.

To Exhibit—*Work piece holder used in conjunction with power driven brushes, *Master sectional type rotary brush for steel industry

Representatives — Robert Wier Jr., sales manager; F. T. Turner, assistant sales manager; R. O. Peterson, manager, technical department; G. R. Lundberg, sales promotion and advertising manager; R. R. Schultz, sales promotion; A. J. Chandler, sales engineer; V. K. Charvat, B. E. Nelson, technical engineers; R. C. Sasena, E. J. Richard, development engineers; M. C. Pecsok, C. W. Titgemeyer, vice presidents; R. Ruthenberg, C. W. Newman, J. R. Broughan, sales representatives

Pacalid Division, General Aniline & Film Corp. 2427
Johnson City, N. Y.

To Exhibit—54-inch Printmaster, Super B and Streamliner machines

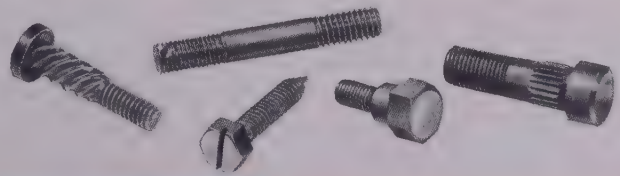
Source for Special Parts

Your own design formed and threaded parts produced *Extra Fast* with *Extra Economy*

Cold forged by our application of the Kaufman Process

Here's a slick way to hold costs down for a competitive market. Have your unusual parts and fasteners made by fast economical forging—the Kaufman Process—at Cleveland. In production quantities, this method provides extra savings in both cost and delivery time. It gives you *stronger* parts; this process toughens surface sections while preserving the interior ductility of the steel. Your steel specifications and heat treatment requirements are fully met. It pays you to send blueprints and specifications for our estimate.

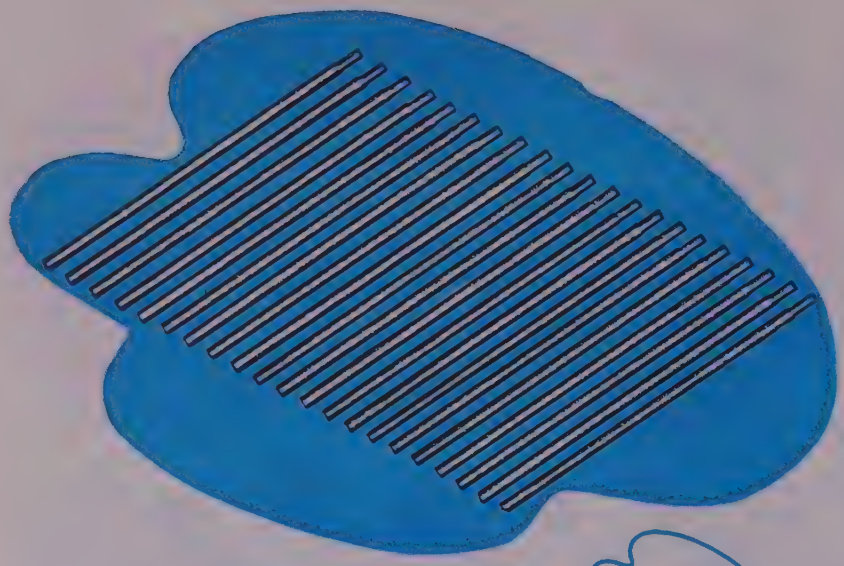
THE CLEVELAND CAP SCREW COMPANY
2917 EAST 79TH STREET • CLEVELAND 4, OHIO



CLEVELAND *Top Quality* FASTENERS

ORIGINATORS OF THE KAUFMAN DOUBLE EXTRUSION PROCESS

Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners



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EASY TO HANDLE

FINE WELD APPEARANCE

NOW 21 STAINLESS ELECTRODES

BEAR THE M&T LABEL

Twenty-one stainless steel electrodes—selected by Metal & Thermit for peak performance under every condition—provide the answer to every stainless steel welding requirement . . . and give you sure and easy selection of the one *right* electrode for the job at hand!

Whether you are fabricating stainless for corrosion resistance or heat resistance—whether you need straight 18–8 or 25–20 or 25–12 or whether you require columbium, molybdenum or other modification of these analyses—there's an M & T rod to match your needs. Available too, with lime or titania coatings for DC and with specially designed coatings for both AC and DC welding.

For the correct answer to your stainless steel welding problems, write for the new descriptive bulletin and handy selector chart on Metal & Thermit stainless steel electrodes.

M & T Stainless Electrodes are members of the "Select 70"—a group of seventy outstanding electrodes offered by M & T—along with M & T AC and DC welding machines, and M & T accessories—to provide everything needed for arc welding—arc welding of top-notch quality.

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120 Broadway • New York 5, N. Y.

CHICAGO NEWARK CINCINNATI PHILADELPHIA CLEVELAND PITTSBURGH HOUSTON SO. SAN FRANCISCO MINNEAPOLIS TORONTO

Representatives—James Griffin, East central regional sales manager; Hugh Silbaugh sales promotion manager; L. C. Knaphle, advertising; Donald Jennings, market development engineer; Raymond Moore, Ozalid Detroit office; Harold Burk, Ralph Coburn City Blue Printing Co., Cleveland; representative of C. B. Collins Supply Co., Pittsburgh

Park Chemical Co. 54

Detroit, Mich.

To Exhibit—*Neutra-Gas process

Representatives—F. L. Woodside, president P. H. Kramer, technical director; L. M Harris, general sales manager; R. N. Lynch sales manager, Heat Treating Material Division; C. R. Foreman, metallurgist; A. A Aponick, Richard Hammerstein, T. J. Clark M. J. Vandenberg, W. P. Woodside Jr. sales representatives.

Permanente Products Co. 120

Oakland, Calif.

To Exhibt—Products made by Permanente customers from alloy 150S and other aluminum alloys will be displayed, aluminum siding, shade screening, aluminum electrical conductor

Representatives—R. H. Black, district sales manager; V. A. McChesney, assistant manager, development and engineering; J. R Scrivener, engineer, development and engineering; Frank Shackelford, display director; John Leahy, sales promotion; C. S French, central divisional sales manager; V H. Bradford, assistant manager, development and engineering

Physicists Research Co. 142

Ann Arbor, Mich.

Representatives—Ernest J. Abbott, manager Frank W. Kabat, Fred J. Engelke, field representatives

Precision Shapes Inc. 277

Suffern, N. Y.

To Exhibit—Component parts made by patented continuous milling process

Representatives—Paul H. Fassnacht, president; Norman M. Dickson, sales manager

Production Machine Co. 92

Greenfield, Mass.

To Exhibit—*Type A centerless feed machine for polishing, finishing, buffing and sanding of rods, bars and tubes; *1W 9-inch wet belt surfacer

Representatives—R. B. Robinson, general sales manager; T. A. Welch, R. W Schwartz, service engineers; P. H. West sales department

Pyrometer Instrument Co. Inc. 162

Bergenfield, N. J.

To Exhibit—*Pyro Bi-Optical and *Micr optical pyrometers, optical, radiation, immersion, surface and indicating pyrometers

Representatives — A. Bollerman, Earl H Whitaker, M. C. Schwer

Ransome Division, Worthington Pump & Machinery Corp. 101

Dunellen, N. J.

To Exhibit—*Model A turning roll of 4 tons capacity for manual or automatic welding of cylindrical vessels, model 75 turning roll of 75 tons capacity for same use

Representatives—F. J. Whelan, vice president, Harrison, N. J.; F. J. Connolly, manager, Positioning Equipment Division, Dunellen, N. J.; A. B. Kime, Eastern region supervisor, Dunellen; P. J. Patton, Western regional superivsor, Chicago; M. O. Paduh advertising department, Harrison, N. J.

Raybestos-Manhattan Inc. 232

Passaic, N. J.

To Exhibit—*Moldisc for use on portable sanders, line of rubber and resinoid-bonded grinding and cutting wheels

Representatives—W. H. Steinberg, sales manager; L. S. Hilton, C. M. Fleming, To Carey, D. L. Cilley, sales engineers, Passaic P. F. Kuzmick, R. G. Brinkerhoff, L. Daley, H. G. Gilbert, A. J. Verrinder

Reeves Pulley Co. 151

Columbus, Ind.

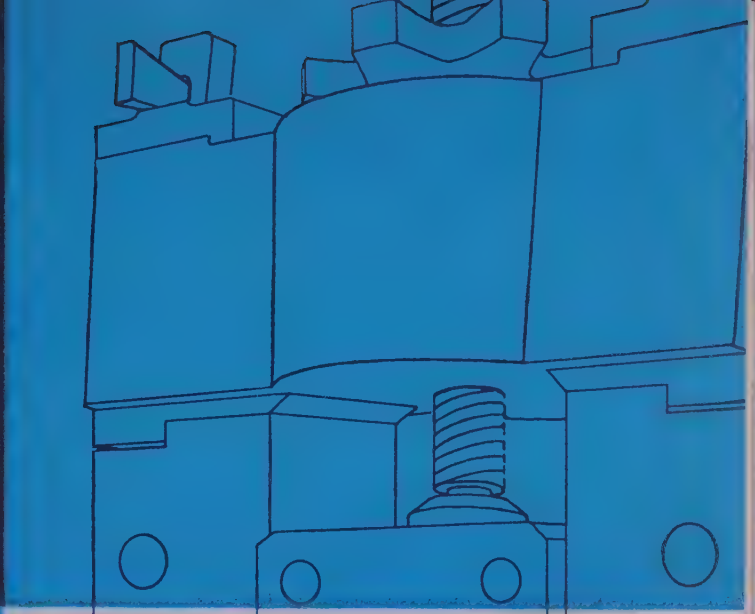
To Exhibit—*Hydraulic control for Motodrive, line of variable speed control equipment, including variable speed transmission Vari-Speed motor pulley and Vari-Speed Motodrive. Basic units will be equipped with mechanical, electrical and fully automatic controls

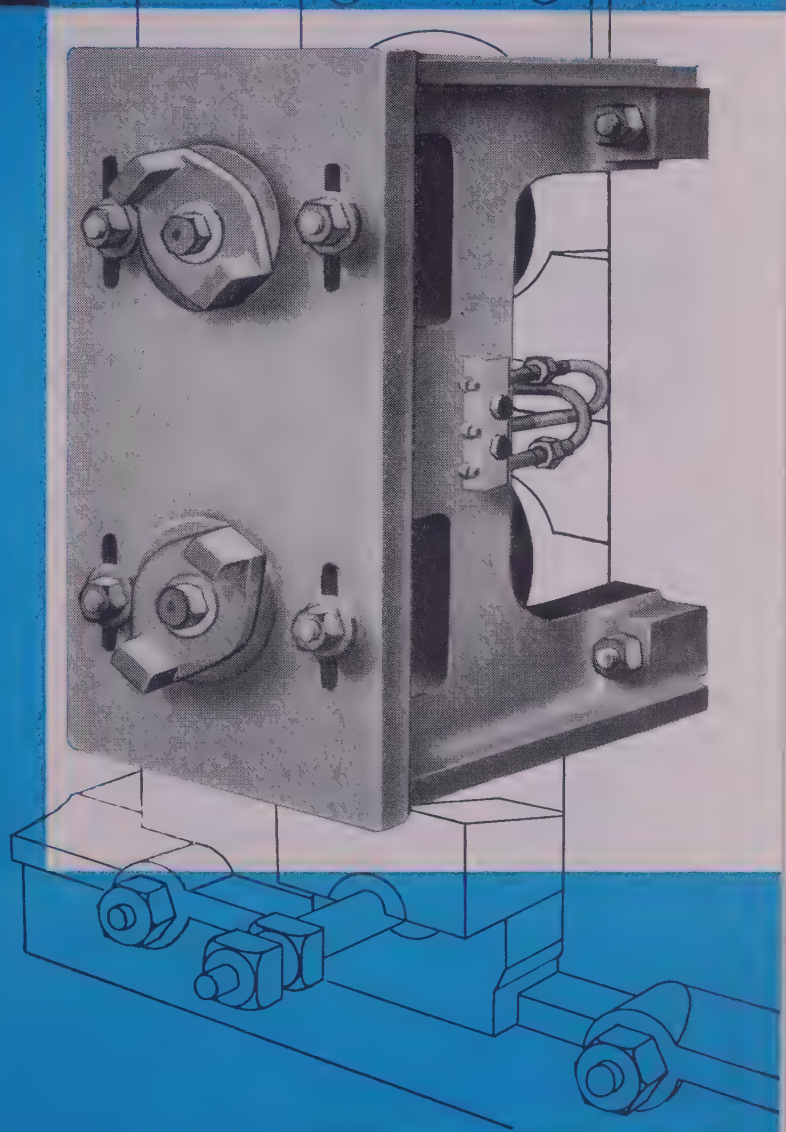
Representatives—J. G. Gepfert, manage

Mack-Hemp

end-thrust bearing

mproves Operating Efficiency of Rod, Bar and Shape Mills





much for glamour, but a bear for work, this ck-Hemp End-Thrust Bearing does an all-'round of improving the operation of rod, bar and pe mills.

Developed by Mackintosh-Hemphill engineers to ablish precise control over the axial matching of passes, this thrust bearing is a self-contained, pact unit which will team up with any type of d radial neck bearing, and which can be used ny mill stand where one end of the rolls is available its attachment.

One of the most important features of the Mack-np Bearing is the simple end-wise adjustment ice which assures matched grooves and precise duct tolerance on high-speed finishing stands.

Other advantages observed in exhaustive tests ude:

- **Elimination of conventional side thrust collars**
- **Permanence of roll groove alignment**
- **Increased life of roll grooves and guides**
- **Long life of anti-friction thrust bearings**
- **Reduced electrical loads in starting and running mill**

atest in the long list of products designed to rove metal-rolling techniques, this Mack-Hemp -Thrust Bearing has passed every operating test. details are available—a qualified engineer is dy to show you why you should keep an eye on t's new at Mack-Hemp.

ACKINTOSH-HEMPHILL CO.

PITTSBURGH AND MIDLAND, PA.

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MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . steel and special alloy castings . . . completely integrated strip mills . . . heavy duty engine lathes . . . the new Mackintosh-Abramsen straighteners . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . shape straighteners . . . shears . . . levellers

What other ⅜ or ½ yard truck shovel has *all* these features?

. . . *cast steel turntable* with deck and side-frames cast in one piece, insuring constant true alignment of shafts and bearings, longer trouble-free service.

. . . *all shafts splined and ball bearing mounted* plus machine-cut gears and sprockets for smoother, longer-lived operation.

. . . *interchangeable turntable shafts, bearings and clutches.*

. . . *tapered hook rollers, ball-bearing mounted,* easily adjustable for wear.

. . . *air-ram operated clutches* that are fingertip controlled—that are fast, positive, dependable.

From wheels to boom-point you get *more* fast-production, cost-cutting features in a MICHIGAN. That's why I selected MICHIGAN . . . and it's why I say *you'll get the most for your money in a MICHIGAN!"*

Write for your copy of Bulletin 100, "On the Job with MICHIGAN," showing MICHIGAN Truck Shovels on jobs like yours.

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you can buy
a brand new
MICHIGAN
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complete with chassis
for as little as $10,250
F.O.B. factory?

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
392 Second Street, Benton Harbor, Michigan, U.S.A.

Cleveland office; C. E. Hill, B. Good, Young, W. G. Kerr, John Hogue, J. Reeves, T. P. Knoedler

Revere Copper & Brass Inc. . . 10(
New York, N. Y.

To Exhibit—Applications of copper, bras bronze, nickel, silver, other alloys and al minum in a variety of fields, such as avi tion, automotive, electrical, plumbing a refrigeration, and household appliances; ste by-step displays and cut-away views of pro ucts

Representatives—R. C. Dalzell, chief techr cal advisor; J. H. Reese, assistant sal manager, Dallas Division; E. C. Lewis, a sistant sales manager, Michigan Divisio J. R. Lumm, district manager, Clevelan S. P. Snyder, V. C. Hoover, L. E. Gibb technical advisors; A. H. Copeland Jr., T. T. Townsend, A. G. Putnam, technical a visory service; T. W. Outwater, P. G. Fu ler, sales representatives; J. R. Hunter, r search department

Reynolds Metals Co. 141
Louisville, Ky.

To Exhibit—Aluminum mill products, sar ples of parts fabricated from aluminur process manuals, technical books

Representatives—P. H. Fox, assistant ge eral sales manager; W. O. Yates, Clevelar office manager; J. M. Stuart, product ma ager, sheet and plate; H. N. Logsdon, a sistant product manager, sheet and plat C. J. Beneke, product manager, wire, ro bar and structurals; N. F. Ritchey, assis ant product manager, wire, rod, bar ar structurals; E. T. Long, assistant produ manager, wire, rod, bar and structural C. L. Thompson, product manager, extr sions; F. W. Boynton, assistant produ manager, extrusions; W. B. Bernstrom, a sistant product manager, pig and ingot; A. Pfister, manager, Akron office; L. Yager, manager, Detroit office; J. R. Relic manager, Pittsburgh office; J. F. Saut, B. Smith, technical service

J. A. Richards Co. 112
Kalamazoo, Mich.

To Exhibit — *Air-operated bender-cutte *air-operated Big Brother bender, Multifor bender-cutter, Big Brother Multiform bend for forming irregular shaped metal par without special tooling

Representatives—J. A. Richards Jr., Paul Richards

Riverside Metal Co. 223
Riverside, N. J.

Representatives—James T. Duffy Jr., pres dent; J. V. Hackett, vice president; W. Hickison, district manager, Cleveland; R Barbier, district manager; Alfred G. De nison, sales department

Joseph T. Ryerson & Son Inc. 41
Chicago, Ill.

To Exhibit—Machining demonstrations usi Rycut free machining alloy steel

Representatives—W. O. Springer, manage Cleveland plant; John W. Queen, Chicag manager, Alloy Steel Division; E. H. Bode mann Jr., manager, alloy and stainless ste department, Cleveland plant

Salkover Metal Processing 152
Cincinnati, O.

To Exhibit—*Aluminum-steel brazing met od and examples of the technique, exampl of controlled atmosphere electric furna copper brazing, controlled atmosphere a induction silver soldering, aluminum brazi

Representatives—Lawrence Jacobsmeyer, e ecutive vice president and general manage Bert Anderson, sales manager, both of Sal over Metal Processing of Illinois Inc.; Wa lace P. Gould, executive vice president a general manager, Salkover Metal Processi of New York Inc.; Frank Humberger, e ecutive vice president and general manage Ernest Guenzel, superintendent; Norman Za mechanical engineer, all of Technical Met Processing Inc., Cleveland; N. M. Salkove

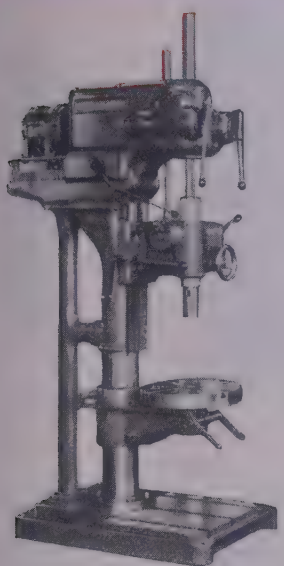
Sandvik Steel Inc. 51
New York, N. Y.

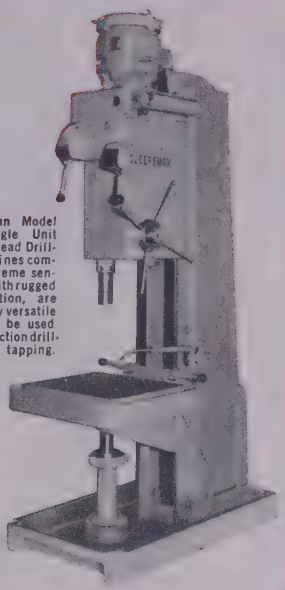
To Exhibit—Products manufactured fro company's various specialty strip steels

Representatives—Carl Hildebrand, presider New York; J. Willis Herb, vice presider Chicago; A. Hurschman, district manage Cleveland; F. J. Satter, New York, J. Lydick, Chicago, E. A. Nedwick, Clevelan N. Bartholdson, New York, B. Brundell, Ne York, sales engineers

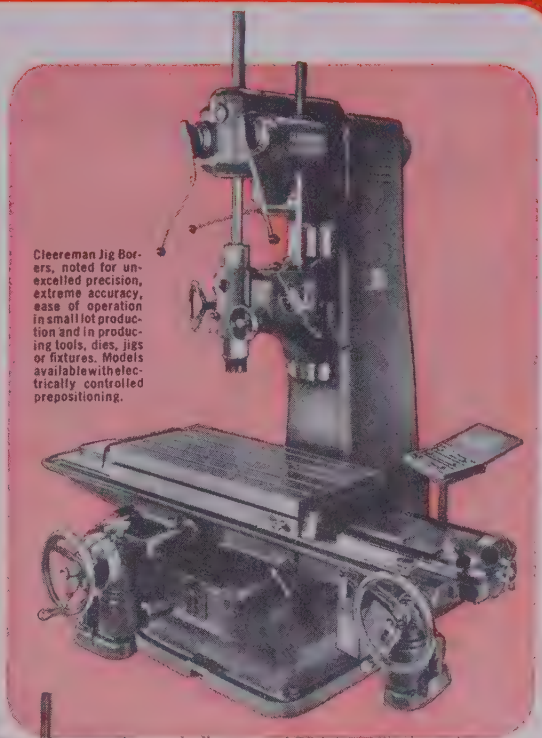
THE CLEEREMAN LINE

OF PRECISION JIG BORERS and DRILLING MACHINES



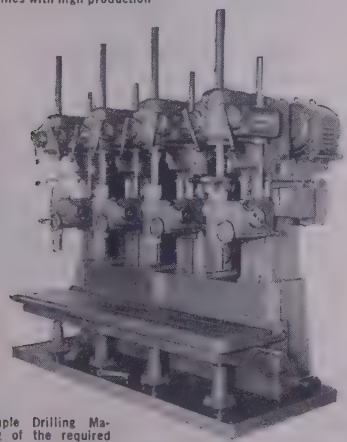


Cleereman Model 325 Single Unit Sliding Head Drilling Machines combine extreme sensitivity with rugged construction, are extremely versatile and may be used for production drilling and tapping.

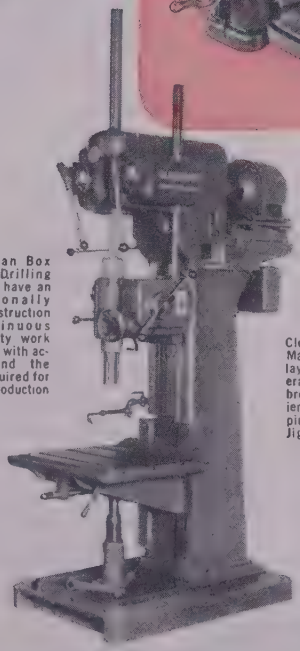


Cleereman Jig Borers, noted for unexcelled precision, extreme accuracy, ease of operation in small lot production and in producing tools, dies, jigs or fixtures. Models available with electrically controlled prepositioning.

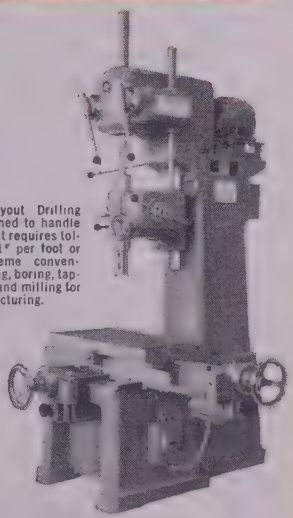
Cleereman Round Column Drilling Machines produce accurate holes at high speed and at low cost and are general purpose machines with high production



Cleereman Multiple Drilling Machines consisting of the required number of machines of any of the three types supplied to meet individual requirements.



Cleereman Box Column Drilling Machines have an exceptionally rigid construction for continuous heavy duty work combined with accuracy and the speed required for low cost production



Cleereman Layout Drilling Machine designed to handle layout work that requires tolerances of .001" per foot or broader. Extreme convenience for drilling, boring, tapping, reaming and milling for jigless manufacturing.

BRYANT
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• Company •
General Office
420 West Madison Street, Chicago 6
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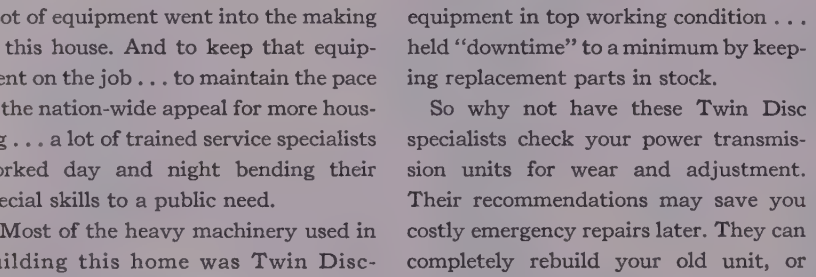
CLEEREMAN MACHINE TOOL CO. Green Bay, Wis.

Sawmill, logging, excavating, grading . . . a lot of equipment went into the making of this house. And to keep that equipment on the job . . . to maintain the pace of the nation-wide appeal for more housing . . . a lot of trained service specialists worked day and night bending their special skills to a public need.

Most of the heavy machinery used in building this home was Twin Disc-equipped, from the logging show to the surfacing of the driveway. Trained service representatives from Twin Disc's convenient repair parts stations and factory branches helped keep this heavy-duty equipment in top working condition . . . held "downtime" to a minimum by keeping replacement parts in stock.

So why not have these Twin Disc specialists check your power transmission units for wear and adjustment. Their recommendations may save you costly emergency repairs later. They can completely rebuild your old unit, or supply you with new Twin Disc Clutches and Hydraulic Drives. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).



Selas Corp. of America 28
Philadelphia, Pa.

To Exhibit—*Dehydrator for removing m ture from industrial atmospheres, comb tion system and operating model of conti ous mill heating line, Liquijector for au matic removal of water and water-oil em sions from compressed air or gas, devel ments in Gradiation method of fast-heat metal

Representatives — Frederic O. Hess, Jam Kniveton, Robert C. LeMay, E. D. All W. D. Fuller, Richard C. Jordan, M. Kaufman, W. C. Royal, W. M. Smith, J. Wilson Jr., E. W. Haedike, J. A. Smi George V. Jordan Jr., R. S. Van Note

Sentry Co. 11
Foxboro, Mass.

To Exhibit—Demonstration of hardening high speed steel using Diamond block me od of atmospheric control, equipment, cessories, provision for spot hardening sample tools brought by visitors

Shell Oil Co. 17
New York, N. Y.

To Exhibit—Target display featuring mov target which, when struck by ray of li from a gun, electronically lights up prod panels to give uses, methods of applicat and features of line of industrial product

Representative—E. D. Jette, advertising partment

South Bend Lathe Works 8
South Bend, Ind.

To Exhibit—9 inch by 3½ foot model bench lathe, 16 inch by 6 foot toolro lathe, 13 inch by 5 foot toolroom lathe, inch by 3½ foot model A underneath dr lathe, 10 inch by 3½ foot turret lathe, inch bench drill press, 14-inch floor d press, 7 inch bench shaper, applicable too attachments and accessories

Representatives—C. L. Miller, R. W. Plan W. O. Robinson, R. G. Keller, sales en neers

Spencer Turbine Co. 27
Hartford, Conn.

To Exhibit — Industrial portable vacu cleaners, turbo-compressors

Representatives—C. S. Gardiner, Clevela S. B. Shearer, Columbus, O.; G. B. Hou ton, Cincinnati, O.; H. A. Tossell, India apolis, Ind.; R. B. Richardson, Detroit; W lard Mack, Bushnell Machinery Co., Pit burgh; R. A. Brackett, sales manager, Ha ford; N. S. Barnes, Hartford

Standard Alloy Co. 9
Cleveland, O.

To Exhibit—*Conveyor belt, specially signed heat and corrosion resisting cast for petroleum industry

Representatives — Charles Gehringer, F Forsyth, Detroit, B. F. Coombs, Houst Tex., Towle & Son, Philadelphia, R. Steele, New York, B. A. Constantine, N England, Robert Schmidt, Pittsburgh, Ed Lindergren, Milwaukee, Pearson Brow Cincinnati, E. A. Mansfield, Buffalo, R. Hayden, Minneapolis, Harry N. Steffen, C cago, C. B. Jackson, W. B. Lum, H. Smith, Paul G. Lutz, Charles Plant J Cleveland, all field engineers

Standard Electrical Tool Co. .. 16
Cincinnati, O.

To Exhibit—*Twin wheel carbide tool gri er, twin motor 24-inch infinitely varia snagging grinder, infinitely variable sp buffer-polisher, AR34 Air-Rester dust colle or, abrasive belt machinery

Representatives—W. A. Ferguson, preside J. J. Falls, vice president; Ray A. Hu secretary; J. J. Klopp, treasurer; F. Jenike, W. J. Holtmeier, Leon A. Servati W. Stevenson, district sales representati

Standard Oil Co. 18
Cleveland, O.

To Exhibit—Acme-Gridley automatic scr machine demonstrating *Sulkleer 177-X d purpose cutting oil for machine lubric and cutting fluid

Representatives—M. R. Bower, manager, bricating sales; H. W. Johnston, staff lub cation engineer; C. W. Rupert, M. S. Ob auf, industrial sales managers; G. H. Bla J. H. Allison, F. R. Need, G. C. Svatos, F. Meek, H. U. Cowell, Cleveland represen tives; E. C. Binder, Columbus; J. A. Li say, Toledo; D. A. Bruggeman, Cincinna E. A. Loew, Mansfield; L. S. Burke, Sprin field; J. G. Bergman, Toledo; A. H. Turn

For Economical Production Use

Pittsburgh Seamless Mechanical Tubing

The economy of Pittsburgh Seamless Mechanical Tubing has been proved by many manufacturers in their operations for it helps them make better products—saves time and money too. Pittsburgh Seamless has the size accuracy, surface finish and ductility to give you ease of fabrication in such diverse items as farm implement frames, axles, axle casings, cylinders, gas bottles, windshield wiper bodies and many other parts and products. With Pittsburgh Seamless Mechanical Tubing you can also make an economical selection of physical properties to suit your design as it is available in a wide choice of carbon and alloy grades. For information on how to order write: Pittsburgh Steel Company, Department S, Grant Building, Pittsburgh 30, Pa.

Pittsburgh Steel Company

Grant Building, Pittsburgh 30, Pa.

Improved quality control of metals at **LOWER COST**

SPERRY ULTRASONIC REFLECTOSCOPE

Reflectoscope, Type UR, Style 50E351.

Provides rapid accurate non-destructive testing of steel and other metals

Metals tested by the Reflectoscope are preferred by users who cannot afford lost machine and man hours. The expense of lost work on faulty metals and possibility of service failures are minimized when potentially harmful defects are located before fabricating or machining.

The cost per test is low because it is instantaneous. The operator touches the quartz-crystal Searching Unit to the surface and immediately "sees" through the metal. Discontinuities are revealed on the Reflectoscope screen and are located accurately. For full details write for new Bulletin 50101.

- CONTROLLED SENSITIVITY —can be adjusted to meet quality control standards.
- PORTABLE UNIT — can be set-up quickly by one man.
- TESTS PARTS "IN PLACE" —locates fatigue cracks in shafts, rolls, axles and other stressed parts. Operates on 100-130 volt, 60 cycle current.

See the **REFLECTOSCOPE**
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NATIONAL METALS EXPOSITION
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DANBURY, CONN.

SPERRY
SP-159

Dayton; P. J. Finneran, Zanesville; H. Evans, Columbus; G. E. Mensch, Cant D. T. McClurg, Akron

F. J. Stokes Machine Co. 20
Philadelphia, Pa.

To Exhibit—Model T-4 12-ton powder me press; displays of electrical and mechan parts, bearings and carbides of various p der metals

Representatives—L. H. Bailey, E. S. Walk M. Brown, Philadelphia sales office; M. Adler, Cleveland district sales manager

Superior Carbon Products Inc. . 2
Cleveland, O.

To Exhibit—*Carbon disks, *silver collec rings, *plastic brush on a rod, *sample pen-holder

Representatives—F. E. Wrikeman, Leo W ner, G. E. Zornow, sales representatives; E. Liebert, sales manager; H. C. Walker, gineer; H. H. Wikle, vice president

Superior Foundry Inc. 2
Cleveland, O.

To Exhibit—Rough, machined and assemb gray iron casts, some made by electric f nace process

Representatives—W. L. Seelbach, preside A. D. Barczak, plant manager; L. W. Lee berg, assistant general manager; E. A. H licka, foundry superintendent; J. E. Dunb sales manager; A. C. Jaenke, assistant sa manager; S. W. Feiss, plant engineer; C. Geesey, metallurgist, John Sibbison, assi ant metallurgist; H. W. Wheeler, person manager; T. S. Steffens, production ma ager; Carl Fisher, purchasing agent; J. Solomonson, standards engineer; H. Schaffer, time study engineer; J. C. M ford, sales engineer; R. C. Ascher, W. Dierdorf, O. M. Stanley, sales represen tive

Surface Combustion Corp. 5
Toledo, O.

To Exhibit—*Batch type atmosphere furna *standard-rated Forc-Aire pit convection f nace, *standard-rated Atmotrol vertical m fle atmosphere furnace, samples of pa processed through these installations

Representatives—F. H. Adams, president; B. Phillips, vice president in charge of sal W. M. Hepburn, vice president and chief e gineer; O. E. Cullen, chief metallurgist; G. deCoriolis, director of research; E. Weaver, H. W. Schramm, assistant ch engineers; F. R. Colby, chief drafting en neer; H. M. Heyn, sales manager, He Treat Division; A. H. Koch, in charge standard industrial equipment; A. L. H linger, manager, Steel Mill Division; Cone, engineering department; F. J. Wind sales department; D. K. Martin, Pittsburg L. I. Sieloff, Detroit, H. J. Gregg, Chicag W. O. Owen, Chicago, E. G. Buschow, Pit burgh, Edw. Stephenson, Detroit, J. Standish, Pittsburgh, B. M. Sharpe, India apolis, G. J. Langenderfer, Fort Wayne, M. Dempster, Chicago, W. F. Herdrich, D troit, all industrial sales engineers; W. Grover, marketing director; R. C. Way supervisor, industrial advertising; C. Nichols, R. F. Ireland, R. W. Elmenthal advertising department; A. C. Eversole, B. Harrington, Charles F. Dowd Inc., T ledo

Timken Roller Bearing Co. 9
Canton, O.

To Exhibit—Display showing economy of u ing seamless steel tubing

Representatives—H. H. Timken Jr., W. Umstattd, W. B. Moore, C. H. McCollar D. S. Klippert, B. H. Miller, W. E. Tagga A. P. Thomas, L. A. Karg, W. B. Moo R. L. Wilson, E. S. Rowland, J. Welchn J. S. Jackson, A. F. Sprankle, E. Koy Robert Baston, R. L. Nichols, S. Isenber W. G. Bischoff, M. Fleischmann, C. Clark, O. C. Miller, D. J. Girardi, O. Pfouts, P. J. Reeves, P. C. Poss, all Canton; R. P. Donnell, S. R. Lyle, Clev land; J. T. Irwin, Jack Brigham, Chicag A. R. Attebury, New York; L. W. Epple W. E. Judy, Detroit; W. E. Bryden, C cinnati

Turco Products Inc. 140
Los Angeles, Calif.

To Exhibit—Two moving belts showing o jects before and after cleaning by the co pany's products, materials used before ganic finishing for cleaning metal in spr washers and hot tanks, materials for me treating to obtain better paint bond

Representatives—Charles F. Devine, Chica Division manager; A. K. Beard, Clevela District sales manager

ddeholm Co. of America 205
New York, N. Y.

To Exhibit—Display of cold rolled speciality steel from Munkfors works in Sweden; demonstration of Bergsman microhardness tester

Representatives—R. G. Rehder, president; E. V. Enevik, first vice president; W. A. Olsen, vice president in charge of tool steel; F. J. Mackin, sales representative

dylite Corp. 425
Detroit, Mich.

To Exhibit—*Lucite plating barrel, full automatic plating machine, rotary polishing machine. Rectoplaters, bulk processing machine, pedestal type polishing head, bright nickel process

Representatives—L. K. Lindahl, president; C. H. Reeme, vice president; L. V. Nagel, vice president; A. J. Lupien, district manager; J. V. Davis, engineer; William Jackson, engineer, head of barrel department

anadium-Alloys Steel Co. 1401
Latrobe, Pa.

To Exhibit—Vasco Supreme milling cutter used to cut serrations in thread rolling dies of high carbon-high chromium steel, Vasco Supreme blanking dies and punches, sequence of operations used in making laminated wood golf club head, Vasco Supreme shearing head used to cut thin-walled seamless steel tubing, Vasco Supreme die used to blank electric motor laminations from high silicon steel sheet

anadium Corp. of America ... 914
New York, N. Y.

Representatives—Paul H. Schaeffer, Cleveland district manager; L. G. Tinkler, metallurgical engineer

Vall Colmonoy Corp. 508
Detroit, Mich.

To Exhibit—*Colmonoy special No. 1 hard facing electrode with Rockwell hardness of 61 to 65 C, Colmonoy Spraywelder powder metallizing unit in action, setup to demonstrate welding of various hard facing alloys

Representatives—L. V. LaRou, vice president and chief engineer; J. P. Thomas, metallurgist; W. C. Wall, assistant sales manager; C. G. Lee, engineer, E. J. Lell, sales engineer; W. P. Clark, sales manager

Vells Mfg. Corp. 1908
Three Rivers, Mich.

To Exhibit—*Wells-O-Bar Feed Master automatic bar stock feeder for converting horizontal metal cutting band saws into fully automatic cutoff machine, *Model 49A horizontal metal cutting band saw

Representatives—R. W. Bowers, vice president; V. L. Beckle, sales manager; F. B. Hagenbuch, parts and service manager; H. A. Gilbert, E. H. Van Loo Jr., factory representatives

artin Wells Inc. 2518
Los Angeles, Calif.

To Exhibit—*Model 6S heavy duty electrode holder, Master, Stubby, Cub, Suregrip electrode holders

Representative—Martin Wells, president

ouplings Have New Casings

IGHTWEIGHT revolving casings e incorporated in the design of e extended line of flexible shaft uplings made by Diamond Chain o. Inc., Indianapolis, Ind. Made of uminum alloy, the casings are split ially to permit installation or reoval in a space no longer than the pling itself.

Two types are made. Pliable seals over the sprocket hubs at either d to enclose the lubrication. They e made to engage with the 2-strand ller chain and are locked in place the casing. Besides insuring conuous lubrication, longer life and fety, the casings protect against rasive and corrosive atmospheres.

"PACK-BEARERS"

...fine for jungle trails.. but costly in your handling operations

MECHANIZE material handling—release manpower for production operations—and you cut excess material handling costs—speed production.

Wherever packages, parts, or units are handled—loose or in containers—there is a type of Standard Conveyor (gravity or power, roller, belt, slat, chain, wheel—portable unit) expressly designed to do each particular job best.

Standard Conveyor is nationally known as a reliable source for conveying equipment of wide range, versatility and flexibility. The answer to your specific needs in cost-cutting, time-saving conveyors can be found at Standard.

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ROLLER · BELT · SLAT · CHAIN CONVEYORS • PORTABLE CONVEYORS AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS

New Books

The Ferrous Metals Industry in Germany during the Period 1939-1945, by George Patchin, formerly principal of Sir John Cass Technical Institute, London, and Ernest Brewin, intelligence officer of British Iron and Steel Federation; 270 pages; published for the British Intelligence Objectives Sub-Committee by H. M. Stationery Office, for $1.45 postfree; available in the United States from British Information Service, New York.

This extensive volume is in nine sections, covering blast furnace plants and practices; steelworks plant and practice; mechanical treatment; foundry practices; steels, ferroalloys, hard metals; heat treatment; cutting, joining, repairing, fastening; coating (including cladding and bonding); and research and testing. Critical analyses and comparisons of prewar and wartime practice are given and deviations from British and American practice, with their resulting advantages or disadvantages are related.

Trends, induced by material shortages or by availability of new or alternative materials and processes are recorded. Also discussed is the possibility of future application of wartime innovations. A section o research stresses the close link b tween German investigators and th industries concerned and surveys o the iron and steel research center A comprehensive index and cross reference system are incorporated i the report.

—o—

Aluminum and Magnesium Desig and Fabrication, by R. Burt Schulz supervisor of manufacturing researcl Glenn L. Martin Co.; cloth, 58 pages, 6¼ x 9¼ inches; published b McGraw-Hill Book Co., New Yor N. Y., for $7.50.

Providing a practical approach t light metal product design and fab rication, the book reflects the prac tical experience and research of au thorities in the field. The data o aluminum and magnesium and th processing of these materials, th manufacturing methods and cost involved make it possible for the de signer, engineer and manufacturer t judge when and where aluminum o magnesium suits a specific need.

The author has attempted to pro vide a source of general informatio about light metal design and fabrica tion to fill a void created by th many government and manufacturer' publications during the war perio which, although excellent, dealt wit the production of a specific product thereby limiting their scope.

Particular attention is paid to ma chining, welding and bonded fasten ings and to finishing. Many data ar arranged in graphical or tabular form and use is made of a considerabl number of photographs and lin drawings of equipment, operations designs and fabrications.

—o—

Dynamic Equipment Policy, b George Terborgh, research director Machinery & Allied Products Insti tute, Chicago; cloth, 290 pages, 6½ x 9¼ inches; published by McGraw Hill Book Co. Inc., New York, N. Y for $3.75.

According to the author, equip ment policy is the most backward area of industrial management. Ef fective organization for bringing profitable re-equipment opportunitie to the attention of management i lacking in many companies, h opines, stating that in most case the executives who have to make th decisions have no adequate techniqu for analyzing the merits of the sub mitted proposals.

Book develops the basic principle of sound re-equipment analysis an discusses practical procedures fo their application. Not only does i illustrate procedures by example

Protects structural steel work, or concrete against deterioration from corrosive fumes, gases, or atmospheres . . . resists acid spillage or condensates.
Flexible, tight-adhering plastic film resists impact; will not chip, flake or craze. Proven over a 10-year period in America's chemical plants.
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Write today for your free copy of Bulletin 709. Learn how you can cut corrosion losses with Tygon Paint. Address Plastics & Synthetics Division, The U. S. Stoneware Co., Akron 9, Ohio.
U. S. STONEWARE
Akron 9, Ohio

ken from actual experience, but in e light of these principles and pro-dures, it appraises the devices and les of thumb now in use, showing e errors to which they lead.

Analysis of replacement problems gins with the replacement of rented uipment and continues to the re-acement of ownership by lease and lease by ownership, then going in-the main problem of replacing vned assets by other owned assets. ndamental problem of prediction in vnership replacement is considered d the necessity of making assump-ons as to the future when predic-on is impracticable is also covered. oncluding portion of the book is de-ted to a criticism of some of the placement formulas now in use and a consideration of the importance dynamic equipment policy, both r the individual business and for e economy as a whole.

—o—

Welding and Cutting Manual—ow to Use Your Oxy-Acetylene utfit; cloth, 208 pages, 6 x 9 inches; ublished by Linde Air Products ompany, New York, for $1.80.

Intended as a reference and in-ruction book for anyone who does elding and cutting, this book is ritten especially for the repair man, echanic, and maintenance man. he simple, easy-to-read style and e step by step instructions and notographs of actual jobs should lp any welding operator to do a tter job. Included are chapters on nding, forming and straightening etals, soldering and brazing with e air-acetylene flame, steel and st iron cut as easily as wood, re-iring and rebuilding by welding, rd-face wearing parts for long life, elding and cutting steel pipe and ints to remember in welding most mmon metals.

One chapter is devoted to 100 ings that can be made by the weld-g operator, these including machin-y guards, trailers, benches, tools d gates. Another chapter is de-ted to how to set up and operate e outfit. An appendix contains eful charts and tables, a glossary welding terms and a list of 100 re-ir jobs with recommended welding ethods.

—o—

Oil Hydraulic Power and Its In-strial Applications, by Walter rnst, vice president and director engineering, Commonwealth Engi-ering Co. of Ohio; cloth, 366 pages, ½ x 9¼ inches; published by Mc-raw-Hill Book Co., New York, for .00.

Dealing with the development, eory and practical applications of hydraulics, this book passes over

CM HERC-ALLOY

Write for your copy of this new, informative booklet. No charge.

COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
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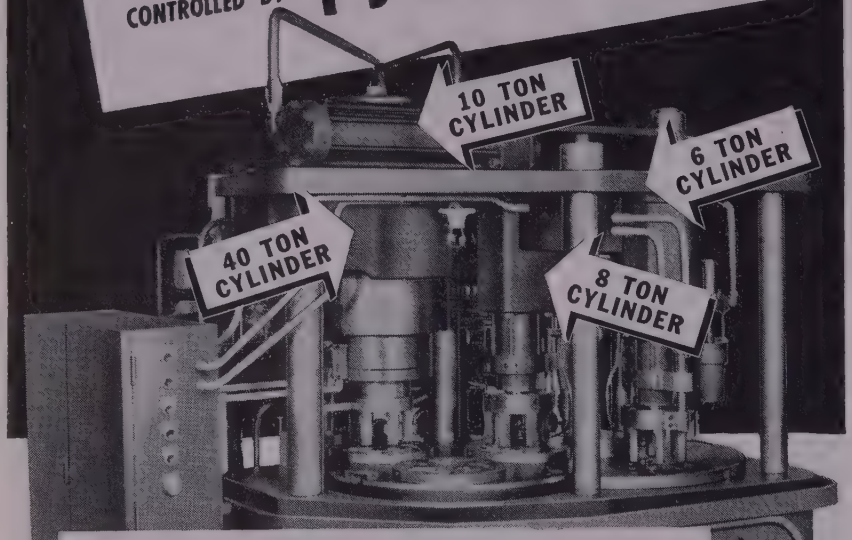
Job File No. 1949

MALLEABLE NUT PRODUCTION

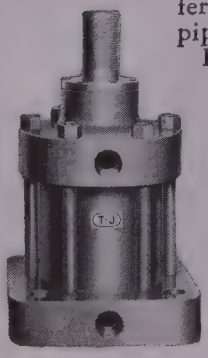
Fully Automatic

CONTROLLED BY T-J CYLINDERS



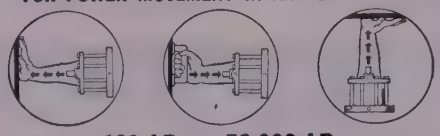
All moving parts are controlled hydraulically by T-J Cylinders—on this Malleable Nut Production Machine designed and built by Roy Hays & Associates, Rockford, Ill., for the Wagner Malleable Products Co., Decatur, Ill.

It's *fully automatic*—the operator only places nuts in stations. Nine T-J Cylinders, 40 ton to ½ ton, help complete the job of cutting off sprue, sizing, boring, facing, chamfering and threading 2,500-¾ std. pipe thread nuts per hour.



For your tough jobs of power movement — pushing, pulling or lifting—*save labor, speed production* and *cut costs* with T-J Air and Hydraulic Cylinders! Many standard sizes and styles . . . both cushioned and non-cushioned types . . . 100 lb. or 50,000 lb. Precision-built for long-life dependability. Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Mich.

FOR POWER MOVEMENT IN ANY DIRECTION



100 LB. or 50,000 LB.

T-J

TOMKINS-JOHNSON

RIVITORS . AIR AND HYDRAULIC CYLINDERS . CUTTERS . CLINCHORS

vague generalities to give actual d tailed sample calculations and desig for hydraulic components, pumps a valve.. Latest practices in hydraul components, oil circuits and applic tions are covered.

Fundamentals, such as behavior oil under pressure, flow characteri tics, viscosity and behavior in h draulic machinery are included in t first portion of the book. Succee ing chapters deal with the generatio of oil hydraulic power by rotary an plunger pumps, its utilization in r tary and reciprocating motors, it control by suitable valves and it transmission through piping, tubin and fittings.

The author has attempted to mak the text useful, not only to student and engineers engaged in design an manufacture of this type of equi ment, but also to present and p tential users of this means of powe transmission. For this reason he ha incorporated material dealing wit available components and their us and application.

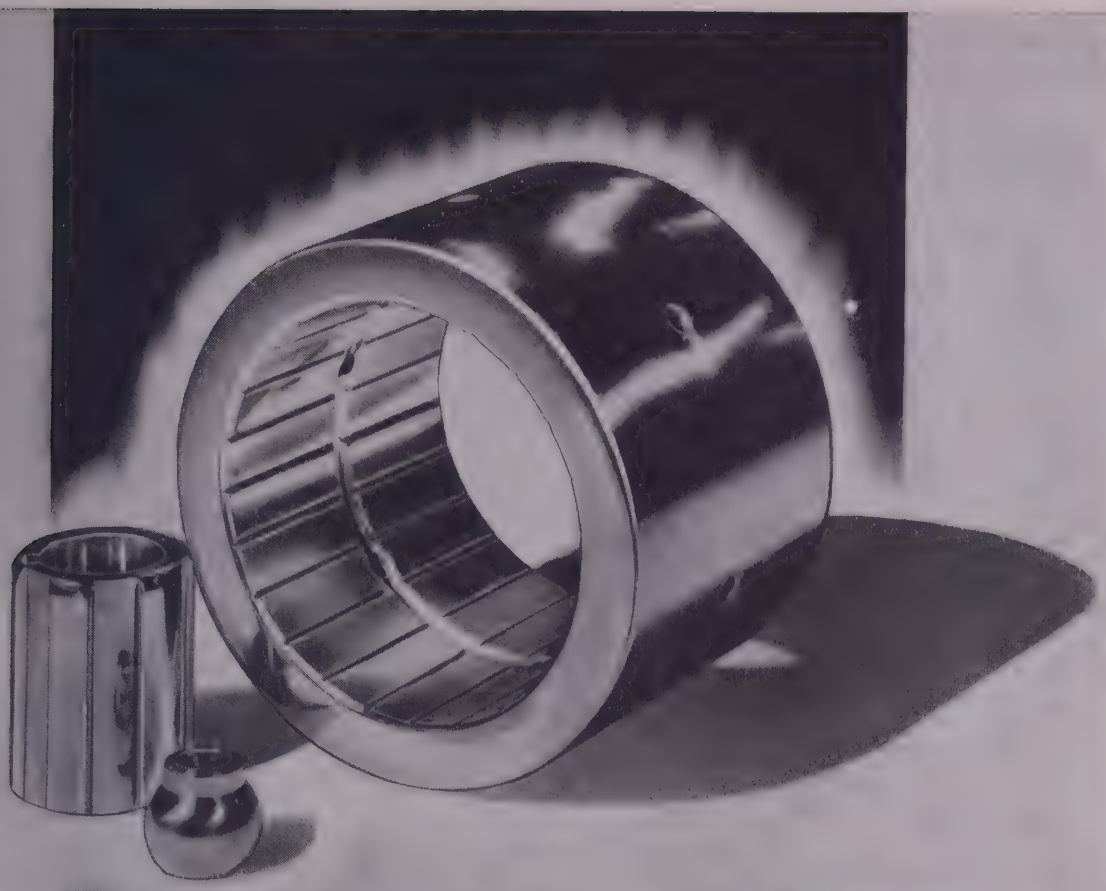
Electrical Raceways Book

DESIGN and installation problem encountered in the use of rigid stee conduit and electrical metallic tubin are dealt with in a 131-page book *Steel Electrical Raceways,* publishe by electrical distribution system committee of American Iron and Stee Institute, New York. It contains basi dimensional data as well as code ta bles that pertain to conduit wirin installations. It also includes prac tical suggestions applicable to th handling and installation of thes materials.

British Technical Reports

WHAT happens to the structure of particular steel when it is held at certain temperature after rapid coo ing from above the critical tempera ture is shown in curve form in th "Atlas of Isothermal Transformatio Diagrams", one of a series of specia reports offered by British Iron Steel Institute, 4 Grosvenor Garden London, S.W. 1. It is designated a special report No. 40.

Divided into four sections—an in troduction, the causes, occurrence an prevention—is special report No. 4 "Corrosion of Iron and Steel by In dustrial Waters and its Prevention" Special report No. 42, "Report on th Bessemer Process", has sections deal ing with British, foreign and futur bessemer practice. Basic, acid, sur face-blown and multiplexing process es are covered, along with the tech niques as practiced in Sweden, Ger many and the United States.



Buy **Bunting** *Bronze Bearings*

When you buy Bunting Bronze Bearings you receive more than just a physical bronze bearing. More than forty years of experience, the technical skill of thorough metallurgists and engineers, the output of equipment designed for closest tolerance and finest finish—these and more are an invisible part of each Bunting Bronze Bearing and Bar.

A sales organization of graduate engineers is able to intelligently discuss your design and production problems with you. A manufacturing organization that moves swiftly responds to your production schedule on time.

When you buy Bunting Bronze, the entire Bunting organization is alert to the fact that you are a customer and that you want service as well as a product. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in principal cities. 90

Bunting®

BRONZE BEARINGS · BUSHINGS · PRECISION BRONZE BARS

"thickness control"

affects your cash register

★ Savings of $152.00 per 100 sheets of polished 18 gauge stainless steel are real savings! By specifying MicroRold — the Stainless Steel Sheets with "Thickness-Control"—you too can effect such savings. Here's how —

Standard steel buying practice has been to order by gauge number. You can order MicroRold by decimal thickness with a tolerance of only 3%, plus or minus, as compared to the allowable plus or minus of 10%.

Average saving in theoretical weight is 3.15 pounds per sheet, or $1.52 per sheet.

Cost of One Sheet of Polished 18 Gauge 36"x 120"* when Thickness May Vary Plus or Minus 10%.

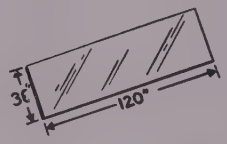
.052"— 65.52 Pounds — $31.61
.051"— 64.26 Pounds — $31.01
.050"— 63.00 Pounds — $30.40
.049"— 61.74 Pounds — $29.79
.048"— 60.48 Pounds — $29.18
.047"— 59.22 Pounds — $28.57

(Theoretical Weight)

Cost of One Sheet of Polished MicroRold .0475"x 36"x120", Plus or Minus 3% on Thickness.

.0475"— 59.85 Pounds — $28.88

Each one-thousandth inch (.001") variation in thickness represents 1.26 pounds on the standard 36"x120" sheet. *And you pay for steel by weight.*



So, you may save $152.00 per 100 sheets of polished 18 gauge sheets when you buy MicroRold—the Stainless Steel Sheets with "Thickness-Control."

**Savings are figured on a price of 48.25c per pound for Type 302 Stainless Steel, price including base; gauge, polish and quantity extras.*

MicroRold® Stainless Steel

WASHINGTON STEEL CORPORATION

120 WOODLAND AVENUE

WASHINGTON, PENNSYLVANIA

System Prevents Coil Frost

PERMANENT elimination of the de frosting operation on low tempera ture heat exchange coils has bee brought about by a system devel oped by Surface Combustion Corp Toledo, O. Tested at temperature as low as 100° F below zero, the sys tem is an adaptation of the Kathaba humidity control system. It is sai never to lose its maximum efficienc due to frost formation on heat ex change equipment or ever to requir a complete shutdown for defrostin at regular intervals. Operation i automatic and continuous.

As it is impossible to cool mois air without condensing some of th moisture as frost, efficiency is reduce and flow of air around the heat ex changer is blocked. Accumulation o this moisture is prevented by con tinually spraying an absorbent solu tion over the cold metal of the hea exchanger, this solution immediatel absorbing any condensed moisture It drips down into a sump, afte which some of it is passed through a regenerator which extracts mois ture from the solution so that it wil be able to absorb more on the nex cycle.

Liquid used to absorb the con densed moisture is Kathene solution composed largely of lithium chloride and said to be highly efficient, non toxic, noncorrosive and lasting in definitely. It is also reported to have a slightly antiseptic effect on the air passing through it, removing dust and odors, while leaving no odor of its own in the air. It is not carried off in the conditioned air. It is said that the air need not be cooled to the dew point corresponding to the mois ture content required. In other words air with a dew point of —25 degrees F can be obtained without actually lowering its temperature below 0 de grees F.

Motor Exchange Plan Set Up

DESIGNED to minimize inconveni ence if motor failures occur and to get another motor on the job with the least possible loss of productive time, a new motor exchange plan developed by Westinghouse Electric Corp., Pittsburgh, covers single phase and three phase, 1 to 20 hp, frame 203 to 326 alternating current mo tors. Stocks of replacement motors are maintained at the company's warehouses throughout the country. Under the plan, if a motor fails it may be exchanged immediately for a motor of identical rating, there be ing three types of exchanges.

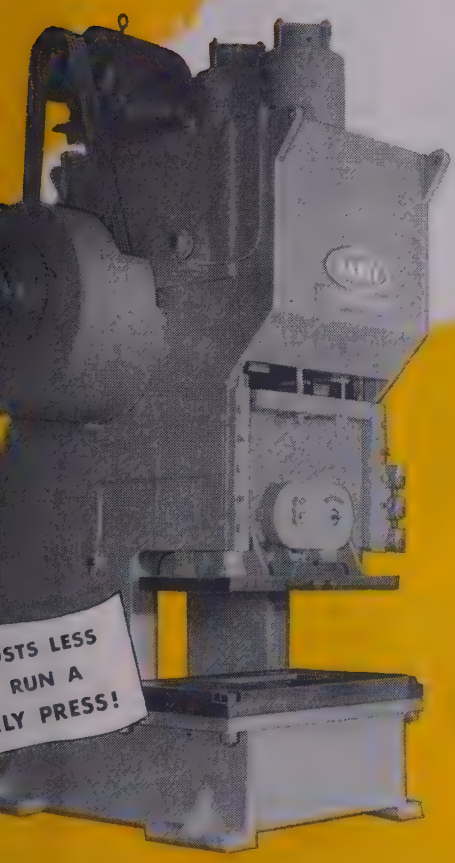
Type CSP Life-Line three-phase motors, 1 to 20 hp, and type CAP

Here's why

ANLY PRESSES

run longer

This cutaway view of the new, cool-running Danly Clutch shows how the friction discs are held in place by their retaining "spider."



Send for this free booklet on the new Danly AUTOFEED Presses today and see how these outstanding features save money on high production stamping runs.

THE NEW COOL-RUNNING DANLY CLUTCH OUTWEARS CONVENTIONAL CLUTCHES 7 TO 1!

...and greatly reduces the largest single item of press operating costs, clutch maintenance. The cool-running Danly clutch overcomes heat...major cause of clutch wear...by reducing clutch "pick up" load 80%. High velocity air cooling of all internal parts produces a still further reduction in operating temperature so that a Danly Clutch in continuous operation runs only 35° above room temperature. Actual tests under normal operating conditions resulted in only .006" of friction surface wear for 100,000 engagements in a Danly clutch against .043" of wear in a conventional type clutch.

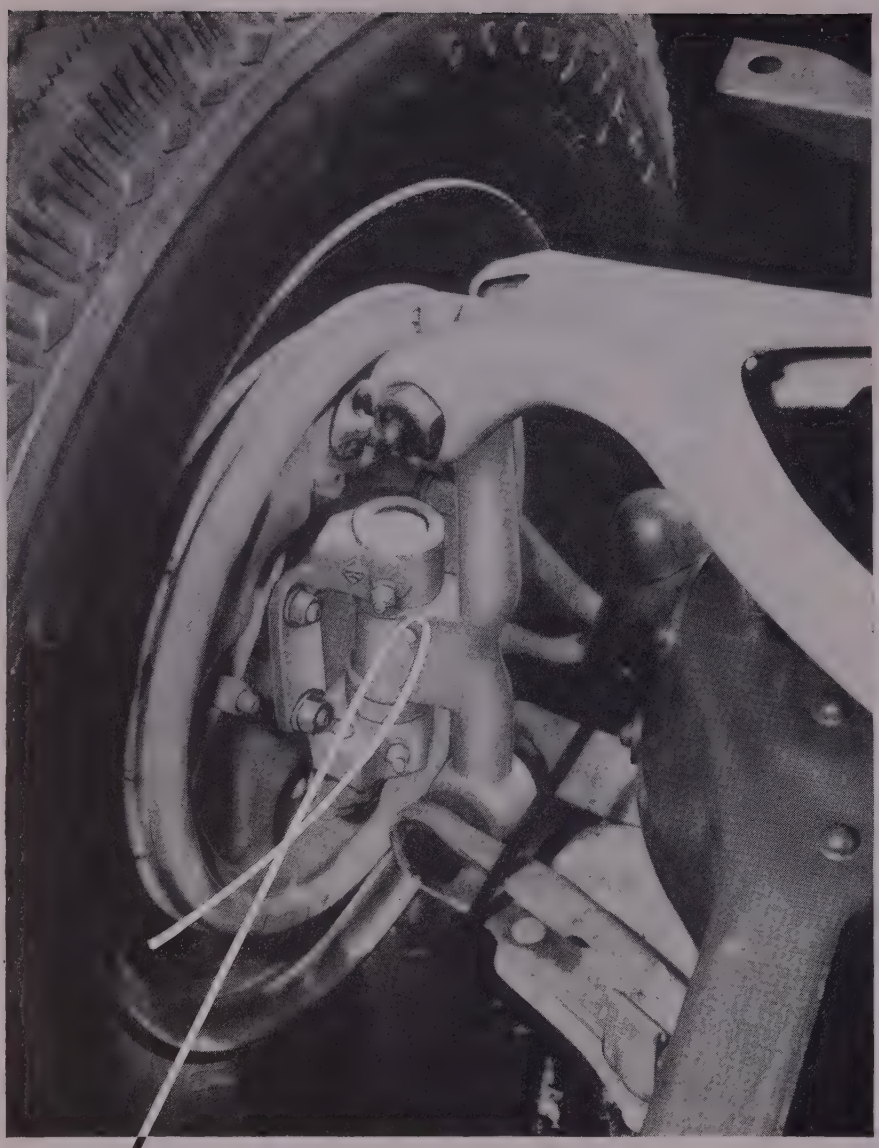
And complete renewal of friction material takes less than 30 minutes! Only quick replacement of special friction discs in an easily accessible spider is required. No riveting, fitting or extensive disassembly is necessary.

Other outstanding features include positive pressure lubrication throughout, completely stress relieved frame weldments, and sensitive control reaction. All of these outstanding Danly Press advantages are certain to reduce overall operating costs, through labor savings and longer die life.

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS

LY MECHANICAL PRESSES...50 TO 3000 TONS

DANLY



Forgings from **KROPP**

On modern, high speed automobiles the steering mechanism must not fail, for failure could mean disaster. Only forged parts can supply the strength and fatigue resistance needed to withstand the strains encountered.

In all industry, wherever strength and toughness are required, specify forgings. And for consistently high quality and dependable delivery, specify *Kropp* forgings. Our complete drop, hammer and upset facilities are at your service for the production of "forgings to your specifications."

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5301 W. Roosevelt Rd., Chicago 50, Ill.

Are you receiving "FORGINGS". . . . the KROPP publication for industry? If you want to keep current on forging facts, send us your name and address and ask for "FORGINGS".

Life-Line single-phase motors, 1 to 7½ hp, may qualify for either Class I, Class II or Class III exchange. Class I exchanges include those motors returned which have failed under conditions constituting a breach of warranty; no charge is made for the replacement motor. Motors failing outside of warranty, and requiring major repairs fall into Class II, for which a flat charge is made. Class III covers those motors returned for failure outside of warranty and requiring only minor repairs such as replacement of bearings, capacitor, switch, etc. Small charge is made by the company for these replacement motors.

Symbols for Gear Engineering

LATEST addition of the American standard letter symbols for gear engineering, for use in those mathematical equations and formulas that deal with toothed gearing, may be obtained from American Standards Association, New York. It was prepared by the sectional committee on standardization of gears, sponsored by the American Gear Manufacturers Association and the American Society of Mechanical Engineers.

A letter symbol is a single letter representing a numerical value in equations and formulas. In the field of gear engineering, such equations and corresponding calculations may deal with the design, application, manufacture, inspection, formulation of new methods and solution of problems. They are not intended or recommended for use on working drawings, manufacturing records or in correspondence where abbreviations, which are merely shortened forms of words, would be of greater value, the association reports.

System of symbols and subscripts given in this new edition is not restricted to existing gear terms and relationships, but can be extended to cover new problems and new investigations.

Installs Huge Belt Press

DEMAND for more and larger conveyor belts has led Raybestos-Manhattan Inc. to install a 320-ton precision hydraulic press for vulcanizing conveyor belts in the Passaic, N. J. factory of its Manhattan Rubber Division. Built to specifications by Baldwin Locomotive Works, Philadelphia, and said to be the largest of its type, the press required a 150-foot long addition to the factory. One of its 45-ton, 40-foot platens took three days to travel 100 miles by special truck.

A system of temperature and pressure controls is said to maintain a

niform condition on each platen of e huge press. Eight controllers erating individual control systems e synchronized to maintain proper mperature during the vulcanizing rocess. Manhattan reported that a ieck of several platens indicated a ss than 2° variation in tempera- re over any one platen surface, de- ite sudden and large load changes id a surface equal in size to that a bowling alley.

attery School To Be Opened

FIVE day school on the care, main- nance and charging of the storage ttery will be held November 14 to at the Trenton, N. J., plant of ould Storage Battery Corp. Com- anies utilizing motive power stor- ge batteries in industrial trucks and aulage equipment are invited to send ttery maintenance supervisors, ma- rials handling engineers, mine fore- en and others engaged in the opera- on of storage batteries and battery erated equipment to the school.

Those attending the course will at- nd lectures on storage battery eory, battery design, electrical eory, battery layout, charging ethods and maintenance procedures. addition, laboratory projects and emonstrations will include assembl- g a complete cell and rebuilding a ttery, charging batteries by dif- rent methods, setting up charging ntrols and schedules and repairing maged batteries with proper tools nd correct carbon-arc burning tech- ques. According to Gould, the eventeen lectures will be mimeo- raphed and given to students for ture reference on the job.

hread Handbook Supplemented

NUMBER of changes in American crew-thread standards which have een adopted by the interdepartmen- al screw thread committee of the ederal government, are included in he supplement to the handbook H28 1944) entitled, "Screw-Thread Stand- rds for Federal Services." Those evisions and additions which have een approved at the time of going o press by committees in the Amer- an Standards Association also are ncluded.

Changes are given for the sections the handbook dealing with Amer- an National form of thread; Amer- an National thread series; screw hreads of special diameters, pitches, nd lengths of engagement; Amer- an standard pipe threads; miscel- aneous standardized products threads f American National form or Amer- an standard pipe thread form; and

See Our Demonstration--
at the A.S.M. Show

Heat-Resistant
KENNAMETAL

GRADE K138
Withstands Oxidation – Resists Thermal Shock
Retains High Strength
at 1800° F.

In the demonstration, a tube of this distinctive material, basically Titanium Carbide, simulates a Resistance Heating Element. It is subjected to alternate electric heating and air cooling in one-minute cycles, while under constant tensile stress of 10,000 p.s.i. Temperature range 1800° to 180° F.

Also featured in the display is a Thermocouple Protection Tube made of Kennametal, which, by means of a high frequency induction coil, is maintained at a temperature of 2600° F.

The Grade K138 series includes several different compositions, each having a specific combination of properties that meet some particular operating condition at elevated temperatures.

Visit the Kennametal Booth. Witness a continuing demonstration of this distinctive development. Talk with our representatives. Perhaps here is the material you have been seeking, but never have found before – heat-resistant Kennametal K138.

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SUPERIOR CEMENTED CARBIDES

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Booth 520
IN THE ARENA

acme threads. An appendix containing descriptive material, charts and tables of the unified standard of American, British, and Canadian standard systems of screw thread is also included in the supplement available from U.S. Government Printing Office, Washington 25, D. C.

Piston Ring Acts as Two Rings

THREE-PIECE design of a piston ring for various types of pumps and compressors, made by Hunt-Spiller Mfg. Corp., South Boston, Mass., is said to eliminate blow-by in both directions of the stroke, thus acting as two rings when installed. Center sections of the double acting rings is T-shaped; two flat sections fit into the relieved sections of the T, each of these pieces being cut into segments and the segments being dowelled in position so that the gaps between them cannot align. The number of segments depends upon the size of the ring.

Installation of the rings on new equipment reportedly is simplified because only one groove has to be machined around the piston head. When installed as replacement equipment the material between the grooves for single rings is machined out and the proper ring and duplex spring are inserted. Rings are made in sizes and widths for all replacement installations.

Offers Foundry Flask Catalog

BOUND in looseleaf form is the foundry flask catalog and price list available from Black, Sivalls & Bryson Inc., Kansas City, Mo. Included in the indexed and well-illustrated edition is information on foundry flasks, bottom boards, core plates, squeeze plates, flat band upsets and miscellaneous loose castings.

Steel is Free-Machining

BETTER machinability reportedly is derived from the use of a new lead bearing, cold-finished steel bar, La Led free-machining screw stock, offered by La Salle Steel Co., Chicago. Made of open-hearth steel, it is said to have good ductility properties, permitting bending and crimping operations. It will also carburize better and have a sounder cross section than other free-machining stock according to the company.

Lead-bearing steels have been shown to have a lower friction component in machining than the same steel without lead. This lower friction between the tool face and the chip being removed helps to keep the cutting edge of the tool from

This "Iron Horse" Has 38,636 Fasteners

It takes 38,636 tough, accurate fasteners of high tensile strength — to match the stress and strain on the framing members of a diesel pulling heavy freight loads.

More than 2,300 bolts . . . 13,800 nuts . . . 21,700 screws . . . 800 rivets furnish the forces that hold modern 4 unit diesel assemblies together.

Because these fasteners have such a vital responsibility, top quality is essential. That's why Russell, Burdsall & Ward for over a century has carried on continuous and intensive research and development work, and has invested consistently in large expansion and improvement programs.

With the price of fasteners such a small part of the total production cost, you'll find it doesn't pay to take chances with fastener quality. For it isn't the initial price but the cost of *using* fasteners that counts.

To attain *True Fastener Economy* —save assembly time, eliminate or reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. *True Fastener Economy* contributes to the kind of production savings that puts more and more diesels on U. S. tracks every year. It is this type of contribution to major American industries that explains why — for over 104 years — RB&W has been *making strong the things that make America strong.*

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Plants at: Port Chester, N.Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

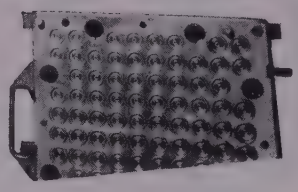
38,636 Fasteners are used in 1 American diesel locomotive

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

THESE 3 SPEED STEELS ARE "money in your pocket"

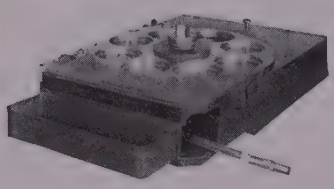
SPEED CASE

A free machining, low carbon, open hearth steel plate, stocked in thicknesses 1/4" to 8". Tensile strength 58-72,000 p.s.i. At cutting speeds of 150-250 s.f.p.m. tool life averages 5 to 15 times that of other open hearth steels. It is easily carburized to achieve high surface hardness, and can be forged, cold formed, or welded, using proper techniques. Ideal for molds, dies, plates, fixtures, sprockets, etc.



80 cavity male Speed Case rubber mold. Machining costs lowered 41%.

SPEED TREAT

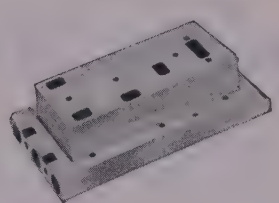


8 station ratchet dial feed, for "cupping" press, of Speed Treat.

A free machining, medium carbon, open hearth steel plate, stocked in thicknesses 1/4" to 8". Tensile strength as rolled 90,000 to 105,000 p.s.i. Average cutting speeds of 135-145 s.f.p.m. produce an excellent finish, reducing polishing time and increasing tool life. It can be direct quenched - carburized and hardened, or induction or flame hardened. Can be forged and welded using proper techniques. Ideal for molds, dies, plates, rollers, gears, crane buckets, power shovel dippers, baling press housings, etc.

SPEED ALLOY

A free machining, hot rolled, alloy steel plate, stocked in widths up to 72", thickness up to 6". High physical properties. Bridges the gap between carbon and tool steels. Has deep hardening properties gained by the addition of chromium and molybdenum. Recommended where relatively high compressive strengths are required. Ideal for extra quality rubber molds, press brake dies, die sets, cold trimming and forming dies, cams, eccentrics, platens, racks, pressure rings, slides, ways, yokes, zinc die cast dies, etc.



Carburized and hardened Speed Alloy mold, with hobbed cavities, made by W & L Molding Co., Kalamazoo, Mich. Note mirror finish.

SINCE 1856

W. J. HOLLIDAY & CO. (INC.)

SPEED STEEL PLATE DIV.

137th & Sheffield Ave., Hammond, Indiana

Plants: Hammond and Indianapolis, Indiana

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Earle M. Jorgensen Co. Los Angeles-Houston-Oakland
Passaic County Steel Service, Inc. Paterson, N. J.
Peckover's Ltd. Halifax - Montreal - Toronto - Winnipeg - Vancouver
Peninsular Steel Co. Detroit, Mich.
Pidgeon-Thomas Iron Co. Memphis, Tenn.
Horace T. Potts Co. Philadelphia - Baltimore

overheating and failing. The phosphorus and sulphur contents of this steel are also said to aid in it machinability. The new steel is available on normal mill delivery in 5/16-inch through 3-inch rounds and in popular hexagon sizes.

Canadian Trade Index Published

APPROXIMATELY 10,000 Canadian manufacturers are included in the 1949 edition of the Canadian Trade Index, published by Canadian Manufacturers' Association Inc., 67 Yonge St., Toronto 1, Ont. The directory is divided into five sections: Special export section, giving information on methods and aids in development of export trade, financing, foreign commercial representatives in Canada, etc.; an alphabetical list of manufacturers, with addresses, branches, brands, etc.; manufacturers, classified according to products made; directory of producers, shippers and exporters of agricultural produce and allied lines; and alphabetical lists in French, Spanish and Portugese.

Standard Out for Acceptance

A REVISION of the simplified practice recommendation R90-46, hacksaw blades, is being referred to producers, distributors and users for acceptance or comment, after having been approved by the standing committee in charge of reviewing these recommendations. According to Commodity Standards Division of the National Bureau of Standards, Washington, the original 1928 recommendation established a simplified list of stock sizes of hack saw blades. The proposed revision is intended to bring the simplified list of sizes abreast of current industry practice.

Midget Mill Catalog

SEVERANCE Tool Industries Inc. Saginaw, Mich., is offering catalog No. 17, listing a line of faster finishing midget mills. Also included are deburring mills and cutters, tubing cutters, countersinks and various other types of mills, cutters, files and reamers.

Handbook in Second Edition

PRACTICAL information on the design, operation and installation of pumps, turbines, compressors and gears is contained in the second edition of the engineering handbook available from DeLaval Steam Turbine Co., Trenton, N. J. Divided into seven sections, its information in

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To open the door to wider profit margins today, manufacturers must scrutinize every possible way to lower production costs. The press has proved many, many times in the most diverse industries to be the "open sesame" to more efficient production. Clearing presses have the precision and rigidity that mean lowest maintenance expense and highest effective output.

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then you need—

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1 Set Outside Diameter of coil opposite Inside Diameter and read Pounds Per Inch Width over arrow.
Coil Weight CALCULATOR
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2 Set Pounds per Inch Width (from 1) under arrow and read Lineal Feet per Coil over Thickness.

Here's just the handy calculator you need for determining the weight of the coils of strip you feed into your automatics.

It's a simple device, like a circular slide rule, which gives you essential data for using Follansbee Cold Rolled Strip and Follansbee Polished Blue Strip in your continuous production lines.

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cludes: Mathematical, mechanic and fluid information of a gener nature applying to the following se tions; steam turbine data; centrifu gal pump data; IMO pump data compressor, blower and exhauste data; helical reduction gear data and worm reduction gear data.

Catalog on Regulators

COVERING its complete line of pres sure regulators is a 32-page catalo published by Air Reduction Sales Co New York. It includes regulator for welding, cutting, special flam processes, for maintaining gaseou pressures in electrical equipment, etc Twenty-six regulators are illustrate and over 100 are described. Thre pages are devoted to flow and pres sure charts and there is a sectio covering regulator adapters an pressure gages.

Finishes Brake Drums

WITH but one operator, a two-sta tion machine built by Gisholt Ma chine Co., Madison, Wis., finishes ove six brake drums per minute. Th automotive type drums come to th machine turned to a surface rough ness of approximately 150 micro inches root-mean-square and are su perfinished down to 30-40 micro inches.

Spindles and controls are independ ent of each other. Each work sta tion consists of a simple arbor an two sets of stones. Two roughin stones and two finishing stones ar timed together to work as the brak drum both oscillates and revolves Air controls the stoneholder move ment and the clamping of the work piece. The complete spindle cycl is automatic.

Magnetic Tests Revised

LATEST revised standard method for testing of magnetic materials ar given in a new pamphlet, A 34, is sued by American Society for Test ing Materials, Philadelphia. Severa companion documents including th standard definitions of terms with symbols and the specifications fo flat rolled electrical steel also hav been issued.

Revision and regrouping of metho A 34 in no way affects current refer ence to these standards on drawing or otherwise, for it will still specif the use of the same methods tha have now been regrouped under othe designations. Copies of the complet 56-page pamphlet, with the seve standards, can be obtained from th society headquarters, 1916 Race St Philadelphia 3, Pa.

or Ultrasonic Testing

A simple and practical method for udying the effect of ultrasonic ener- y on various materials and proc- sses is provided by a new ultrasonic enerator announced by General lectric Co., Schenectady 5, N. Y. converts high-frequency electrical ower into high-frequency mechanical brations in the form of sound waves tched considerably higher than the nge of human hearing. Four vi- ration frequencies of 300, 500, 750

nd 1000 kilocycles permit a wide erating range.

Entirely self-contained in a steel nsole, the equipment consists of a ower unit and a transducer assem- y. The latter consists of a trans- rent cylinder to hold insulating oil ound the high voltage leads com- g from the electronic circuit to e crystal. The transducer or crys- l, forms the bottom of a test well hich is immersed in the insulating . Material to be tested is placed a suitable container within this ell and is directly exposed to the brations from the crystal.

eck No. 1 on Reply Card for more Details

apid Indexing Fixture

Accurate and rapid indexing of ork pieces is possible on punch esses, tapping machines, drill esses and other machines with the ttco-Emrick No. 97 electric index- g fixture, offered by Ettco Tool Co. c., 594 Johnson Ave., Brooklyn 6, Y. Table indexing motions are ntrolled electrically through a modi- ed geneva system to assure shock-less action. A hardened locating pin locks the table at each indexing station.

A built-in electric control automatically synchronizes spindle and table

movements and also controls downward motion of the spindle. Unit is offered with a choice of interchangeable indexing plates ranging from 10 to 14 inches in diameter.

Check No. 2 on Reply Card for more Details

Conveyor with Nonslip Belt

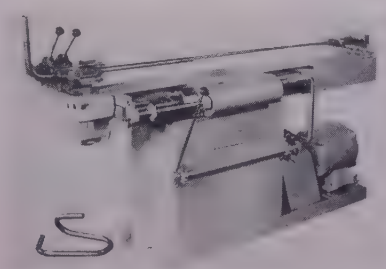
E. W. Buschman Co., Cincinnati 32, O., is offering two models of Trojan portable belt conveyors, with 10 and 15-foot booms respectively. The nonslip rubber belt is positive tracking on a ball-bearing roller bed. The balanced boom section, which may be removed for use anywhere, is raised or lowered with a pressure of less than 5 pounds.

Undercarriage is equipped with two swivel casters for easy maneuverability. Floor locks hold the conveyor in place. A maximum total load of 400 pounds may be conveyed. Belt width in both models is 12 inches and the conveyor has an overall width of 2 feet 8¼ inches. It is furnished with either a ½ or ¾ hp motor.

Check No. 3 on Reply Card for more Details

Semiautomatic Tube Bender

Designed to handle tubes and pipes up to 5 feet in length, but extendable to take any length of pipe is the series 1400 semiautomatic hydraulic



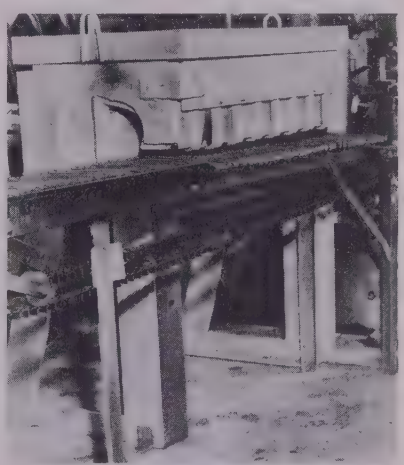
bending machine, designed by Pines Engineering Co., Aurora, Ill. Maximum rated capacity of the self-contained machine is for 1-inch OD 16-gage steel tubing, with a maximum bending radius of 8½ inches to centerline of tube.

It can be tooled to handle serpentine and stacked coil bends and can be adapted to tubing, pipes and bars, as well as rolled or extruded sections. Machine is capable of producing between 100 and 400 bends per hour, depending upon size and length of material.

Check No. 4 on Reply Card for more Details

Furnace Prevents Scale

Preventing practically all scale formation is the high-speed, Roto-Flame end heating type furnace introduced by Gas Appliance Service Inc., 1211 Webster Ave., Chicago 14, Ill. High



manifold pressures, a small combustion chamber and the design of the chamber itself are featured. Furnace may be used for forging, swaging, upsetting, threading, hardening and annealing.

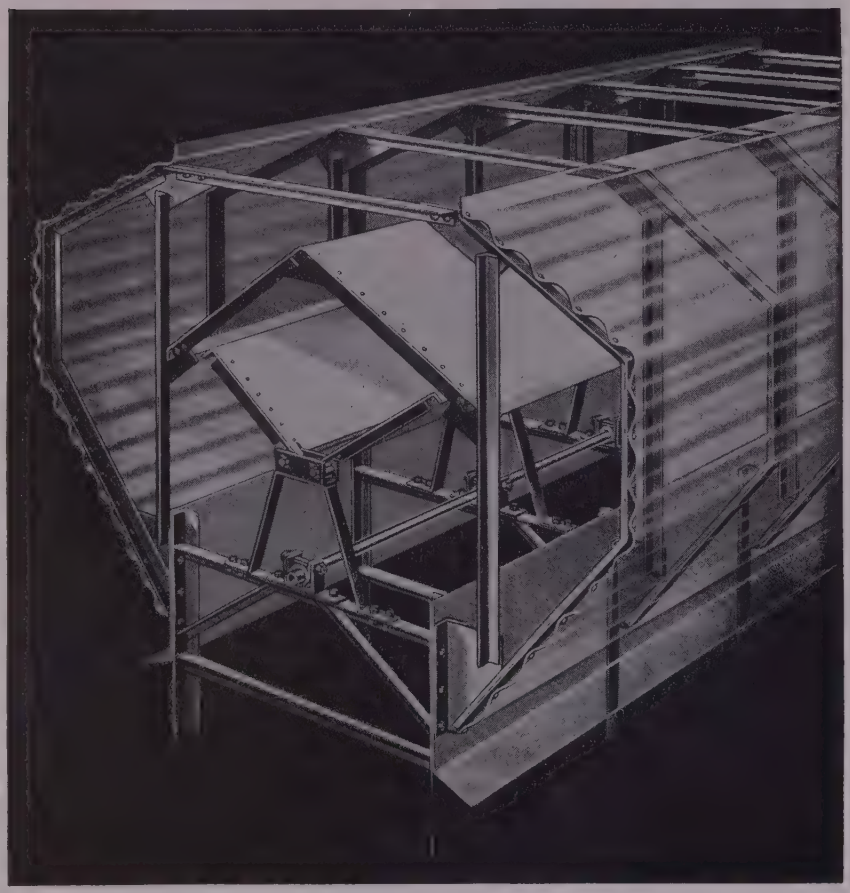
The ends of the pieces being heated are entirely enclosed in flame, limiting scale formation. In operation, the curved refractory section of the Roto-Flame becomes incandescent, with the radiant heat from this surface further increasing heat input. Shape of the refractory also serves to carry the flame inward, keeping the operator cooler and permitting use of a conveyor. Furnaces are available in several sizes and lengths.

Check No. 5 on Reply Card for more Details

Automatic Loading Gear Shaver

Equipped with an automatic loader, a gear shaving machine made by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich., makes it possible to shave all types of external transmission gears regardless of size, in a continuous op-

WHERE HIGH HEAT REQUIRES THE REMOVAL OF LARGE VOLUMES OF AIR **THE BURT MONOVENT MOVES** MOST AIR PER DOLLAR



The Burt Monovent Continuous Ridge Ventilator is particularly useful in heavy industry—steel mills, foundries, forge shops, etc. It may be installed on any type roof and functions as a gigantic exhaust valve along the entire length of the structure. A complete range of sizes from 4″ to 96″ handles almost any application.

Write now, for catalog and data sheets on Burt Monovent. It is one of Burt's complete line of ventilators which includes a size and type for every ventilating need.

SEE SWEET'S OR WRITE FOR CATALOG AND DATA SHEETS

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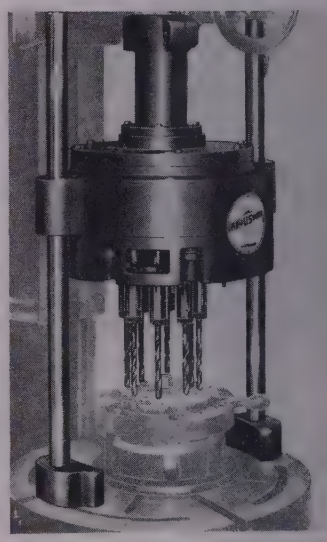
eration as long as the magazine i kept filled. It is possible for on operator to keep magazines of severa automatic loaders filled and all ma chines running continuously.

Cluster, stem and timing gears may be adapted to a machine equippe with the new loading device. Desig and cost of automatic loaders wil vary depending on the type of gear to be shaved and the over-all di mensions of the blank.

Check No. 6 on Reply Card for more Detail

Drill Head Cuts Setup Time

Designed to reduce multiple drilling costs by eliminating expensive changes in setup from job to job is the Adjustafix multiple spindle drill head, manufactured by U. S. Drill Head Co., 616 Burns St., Cincinnati 4 O. As much as 90 per cent of the drill head can be left intact, yet a complete engineering changeover is



accomplished by changing the drill pattern plate and relocating spindles on the new pattern plate to conform with the new design.

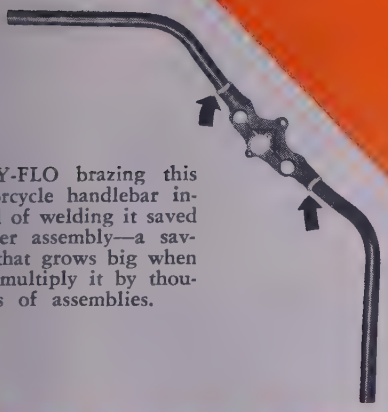
The number of drill patterns possible is limited only by the number of pattern plates available. Spindle and idler constructions are entirely separate assemblies. No change of gearing is necessary in the main drive box when tool speed is changed. Unit can be installed on machines now in use.

Check No. 7 on Reply Card for more Details

Cleaning Machine is Automatic

Employing hydraulic and mechanical operation, the automatic small parts cleaning machine offered by L & R Mfg. Co., 577 Elm St., Arlington, N. J., is furnished with baskets, dividers and basket inserts, as well

A simple way to DO something about ECONOMY-IN-PRODUCTION



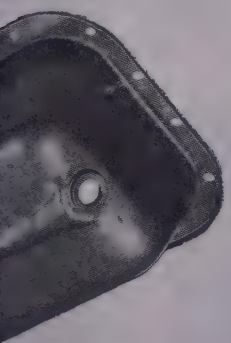
SY-FLO brazing this torcycle handlebar in- ad of welding it saved per assembly—a sav- that grows big when multiply it by thou- ds of assemblies.

Everybody is talking about economy-in-production. It's the keynote of the Metal Show to be held in Cleveland, October 17 to 21. But what counts most is *doing* something about it. In some cases, of course, that's not always so easy. There are, however, hundreds of fabricating operations where economy could be quickly effected by using methods which can be readily adopted.

One such method that offers quick results is *EASY-FLO* and *SIL-FOS low-temperature silver alloy brazing.* It has boosted production and cut costs on thousands of products. Illustrated are a few typical tried and proved ways to

BRAZE AND SAVE WITH EASY-FLO AND SIL-FOS

savings are possible on y parts now machined n the solid by changing built-up assembly braz- with EASY-FLO. The le-sprocket above and e nozzle adjusting part ight are good examples.



Attaching spuds to many types of equipment can be done faster and cheaper with EASY-FLO and SIL-FOS brazing. Using EASY-FLO and induction heating, instead of soft soldering by hand, reduced cost on the automobile oil pan spud (left) from $11.00 to $4.50 per hundred.

Plenty can be saved on many parts now cast, by changing to EASY-FLO or SIL-FOS brazed construction. The gas burner (above), once an iron casting, is now made of tubular steel members EASY-FLO brazed at about 50% lower cost.

Finishing is another operation on which EASY-FLO and SIL-FOS brazing can save plenty. The maker of the EASY-FLO brazed bike frame (above) says—"This method produces joints of great strength which are absolutely clean—free from excess brazing metal—making possible a better looking enamel finish."

DO THIS—NOW

Write today for Bulletins 12-A and 15. They'll give you full EASY-FLO and SIL-FOS details. To get down to brass tacks in a hurry, ask to have a representative call. No obligation.

IF YOU GO TO THE METAL SHOW

in Cleveland be sure to see the EASY-FLO and SIL-FOS working exhibit. Brazing experts always in attendance to answer your questions and discuss your metal joining problems. **BOOTH 337**

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. . . The fast tractor-footed load hustlers

● Don't stop with factory trucks—get the same materials handling efficiency and savings in your yard with a Roustabout. It's speedy, versatile, handles loads to 7½ tons, hook or magnet, year round anywhere. Ruggedly built for years of overwork. Hundreds of users. Make your yard contribute to profits, too—get the Roustabout economy facts now.

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HUGHES-KEENAN CORPORATION

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Load-Handling Specialists since 1904

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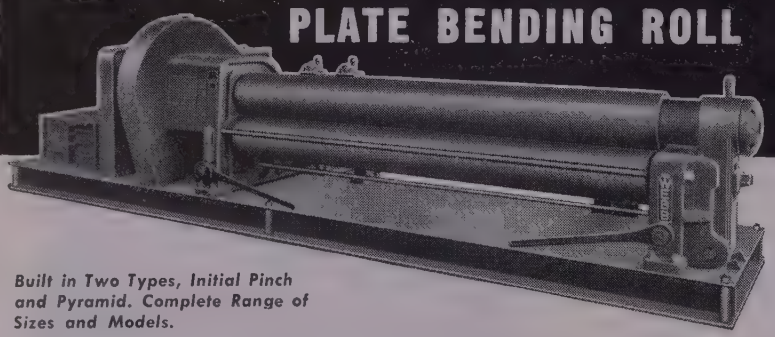
THE **WEBB** PLATE BENDING ROLL



Built in Two Types, Initial Pinch and Pyramid. Complete Range of Sizes and Models.

Prompt Delivery on Standard Sizes

Webb Plate Bending Rolls are designed and built for the forming of cylindrical shapes from rolled steel plate with greater speed and accuracy for high quantity production.

All Webb Rolls are backed by continuous progress in the development of industrial machinery since 1881.

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Industrial Weighing Equipment

THE WEBB CORP.

WEBB CITY, MO.

as with cleaning and rinsing solu tions. Parts are placed in the mos suitable basket, or subdivision the basket and it is snapped on th motor shaft. Equipment is fully auto matic through the cleaner in the firs jar and through the rinses in th second and third jars, and in the dry ing chamber, last stop in the ma chine. A cleaning cycle is complet in 12 minutes.

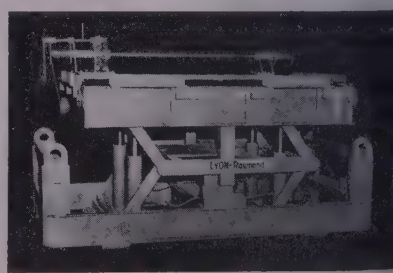
An automatic reversing motor pro duces maximum efficiency by con

tinually reversing the baskets in th solution. One-direction spin-off, abov the solution level in each jar, is auto matically controlled. Baskets fur nished measure 2¼ and 2 inches II and 1¾ and 1⅛ inches deep, re spectively.

Check No. 8 on Reply Card for more Detail

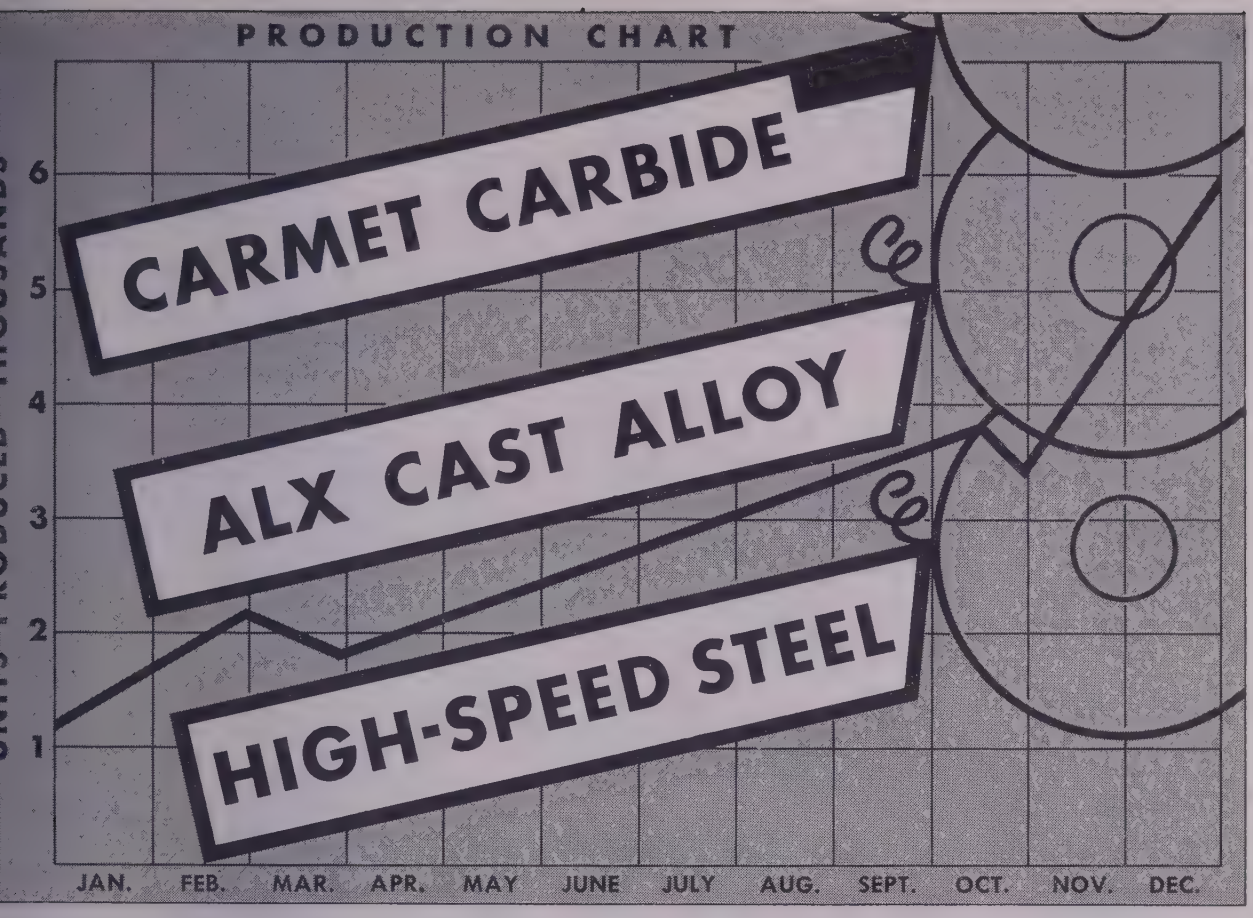
Lifts 20,000 Pound Dies

Features of a heavy duty hydrau lic die handling truck manufacture by Lyon-Raymond Corp., 9151 Madi son St., Greene, N. Y., include ca pacity of 20,000 pounds, four hydrau lic lifting cylinders, motor drive hydraulic pump, provision for insert



ing and removing die slings, hand winch, retractable wheels and rolle top. Range of elevation from 28 t 40 inches allows the table to b used with presses of various heights

When the die is placed on the di table, the platform is in the lowere



Handle all calls with these Nationally Advertised Tools

Packaged for Quick Sales!

SELL THE PRODUCTS in this famous BLUE-AND-GOLD BOX

Send today for general booklet, "Cutting Tool Materials"—also for distributor plan.

ADDRESS DEPT. S-80

How many *sales* are you missing because you are telling customers, "Sorry, we don't carry that type or that grade . . ."?

Here's the newest system that puts you into the cutting-tool business, across the counter, in the most complete way—yet with minimum stock.

All you do is place on your shelf, pre-packaged, these ready-to-use cutting materials in the most popular grades. Then let your customers know.

Calls for High Speed—met with A-L high-speed tool-holder bits. *Calls* for Faster Cutting—met with ALX grade. *Calls* for Top Speed—met with Carmet.

The most satisfying part of all this is that you will be supplying one standard make, and one uniform quality of materials—regardless of the type or application. ● Now is the time to look into the A-L set-up for Distributors. *Today.*

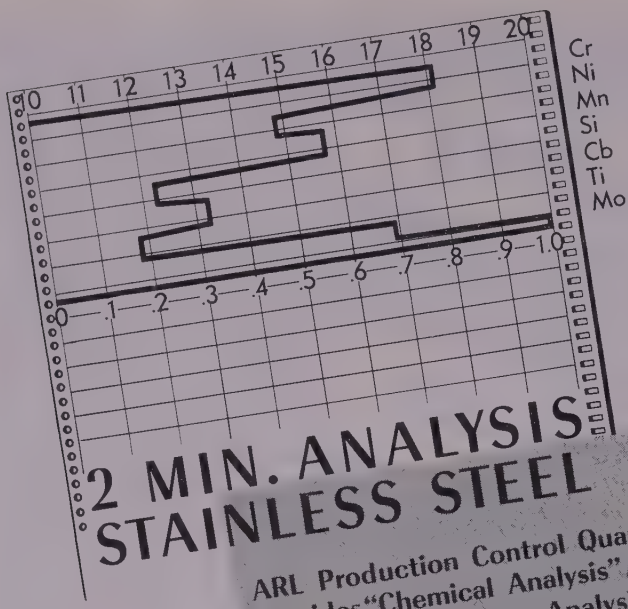
ALLEGHENY LUDLUM STEEL CORPORATION

PITTSBURGH 22, PENNSYLVANIA

Fine Tool Steels Since 1854

W&D 2482

Distributors! { **Write us about handling A-L High-Speed Tool Bits . . . ALX Alloy Tool Bits . . . CARMET Standard Tools and Blanks in your territory**



2 MIN. ANALYSIS STAINLESS STEEL

ARL Production Control Quantometer Provides "Chemical Analysis" Accuracy, with Direct-Reading Analysis Speed.

Bulletin XXI Gives the Details

Applied Research Laboratories
SPECTROCHEMICAL EQUIPMENT
4336 SAN FERNANDO RD., GLENDALE 4, CALIF.

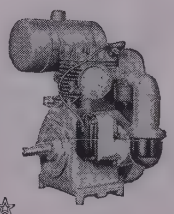
AN ALL TIME RECORD FOR AN ALL STAR TEAM!

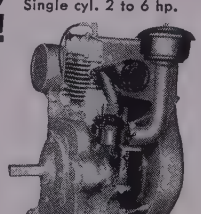
40.2% of All Carburetor Type Engines Built in 1947, 2 to 30 hp. Were WISCONSIN Heavy-Duty Air-Cooled ENGINES!

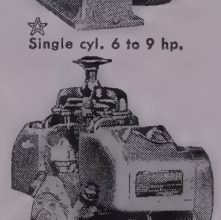
And here's the ALL STAR lineup . . . released in an official bulletin of the Bureau of Census, U. S. Dept., of Commerce, April 22, 1949.

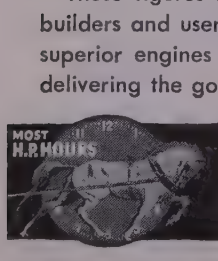
In 1947, Wisconsin Motors built 51.7% of the engines in the 2 to 5 hp. range . . . in the 5 to 9 hp. range, 36.4% . . . 71.6% in the 15 to 22 hp. range . . . and in the 25 to 40 hp. range, 14.7%. Averaged together, 40.2% of the engines in the 2 to 30 hp. range were Wisconsins — excluding automotive, aircraft and outboard marine engines, and engines for use as original equipment by various manufacturers.

These figures sum up the confidence of equipment builders and users who are the final judges in choosing superior engines *where it counts most* . . . on the job delivering the goods.


Single cyl. 2 to 6 hp.


Single cyl. 6 to 9 hp.


V-type 4-cyl. 15 to 30 hp.



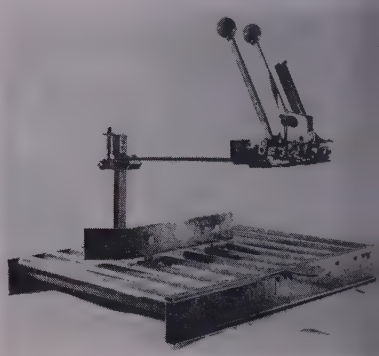
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

position; six vertical posts exte up between the rollers 2 inches support the die and allow the slin to be removed. When the table elevated, the die is free to move the rollers. A winch with a 96 to ratio draws dies from presses to t table and by means of an arrang ment of sheaves also transfers di from the table to the press. Fo sling rings allow the table to handled by overhead cranes.

Check No. 9 on Reply Card for more Deta

Strapping Unit on Conveyor

Acme Steel Co., 2840 Archer Av Chicago 8, Ill., is announcing a ne unit which consists basically of roller conveyor section with a stra ping tool mounted on it, suited f strapping corrugated or fiberboa boxes. Rigid tool mount is adjustab to accommodate packages ranging height from 3 to 23 inches. A bac



stop on the conveyor can be reg lated to assure precise strap plac ment and a steel lip on the fro edge prevents the package from ti ping while the center strip is bein applied. A quick-change bracket e ables the strapping tool to changed within 5 seconds.

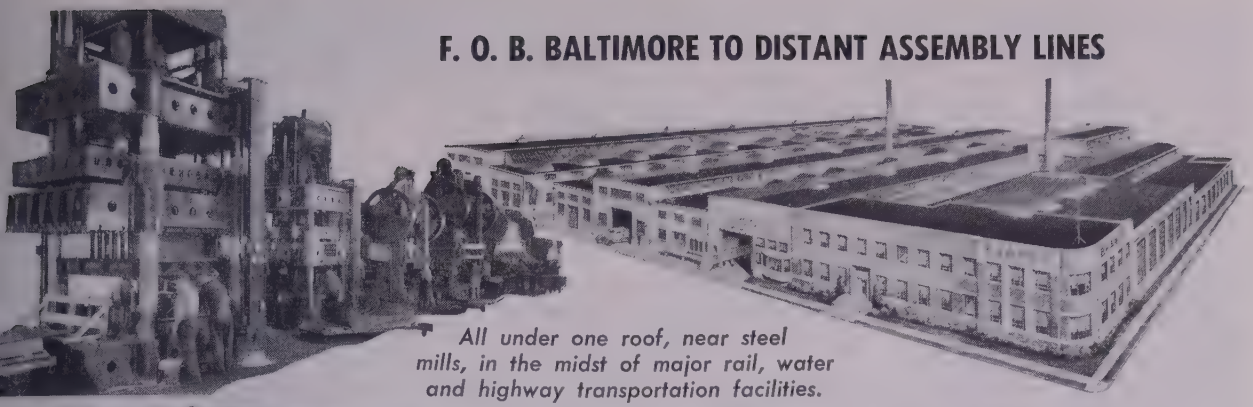
Check No. 10 on Reply Card for more Deta

Packaged Broaching Kit

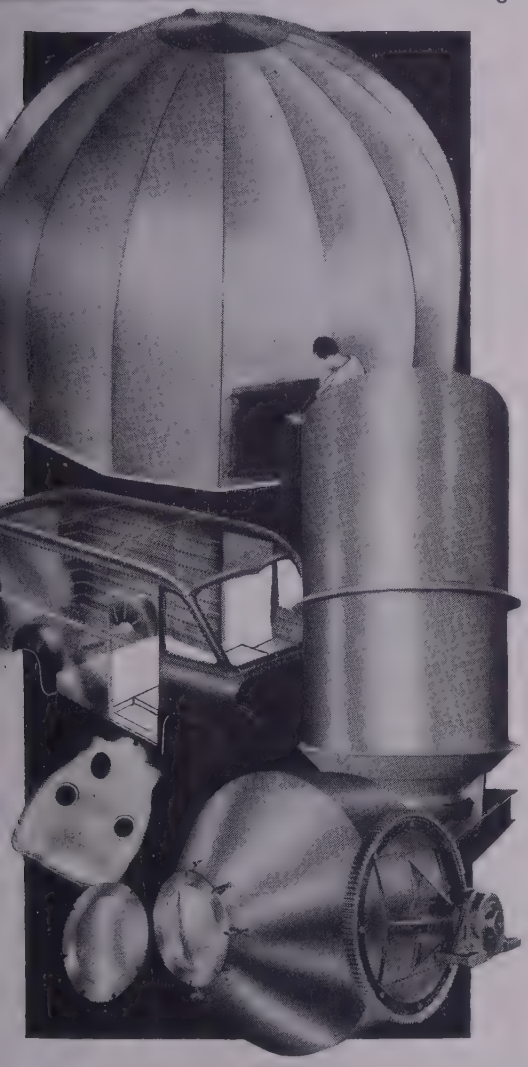
Keyway cutting in a wide rang of bore diameters is facilitated wit a packaged unit broaching kit a nounced by Kase Machine Co., 184 Buffalo Ave., Cleveland 19, O. T standard SB-50 kit consists of a inch diameter Glenny broach, fou interchangeable cutting blades, fiv eccentric bushing-type adapters an a metal carrying case. Blade width are 3/8, 1/4, 9/32 and 5/16-inch an eccentric adapters permit keyway cu ting in bores 1⅛, 1 5/32, 1 3/1 1 7/32 and 1¼ inches in diameter.

Glenny broach kits are availabl equipped with standard ⅜, ⅝, ¾, or 1¼-inch diameter broaches. Sim ple adjustment feature permits key ways of infinitely variable depths t

F. O. B. BALTIMORE TO DISTANT ASSEMBLY LINES



All under one roof, near steel mills, in the midst of major rail, water and highway transportation facilities.



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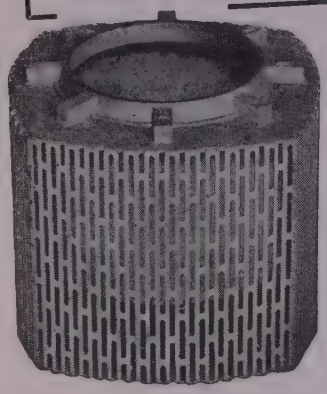
METAL STAMPINGS—HEAVY WELDMENTS—PRESSED STEEL SHAPES

CHARLES T. BRANDT, INC. 1700 RIDGELY ST. BALTIMORE 30, MD.

Perforated Strainers and—



Hendrick is fully equipped to fabricate a wide range of products from perforated plate, that also involve shaping, forming, welding, riveting, brazing, etc. The pump strainer illustrated is a typical example.

For such operations Hendrick has an exceptionally large stock of dies and patterns, complete tool equipment, and ample forming and welding facilities. Write for detailed information.

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HENDRICK

Manufacturing Company

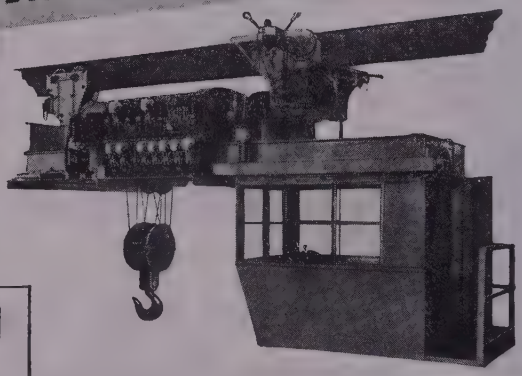
30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

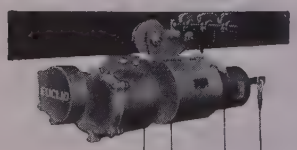
Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

EVERYTHING YOU WANT IN A

MILL TYPE HOIST



Write for Literature Describing EUCLID CRANES and HOISTS.



Euclid offers a complete line of hoists in varied types and capacities, incorporating many design features not found in other hoists.

• This 15 ton Heavy Duty Mill Type Hoist is designed and built especially to render efficient, economical service.

It features: MILL TYPE MOTORS—MAGNETIC CONTROL—MASTER SWITCHES IN CAB—DYNAMIC LOWERING—HYDRAULIC TROLLEY BRAKE—SPRING BUMPERS—SAFETY FACTOR OF 8.

Here is *power* when you want it and *strength* where you need it with coordinated precision control for ease of operation.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST CO.

1364 CHARDON ROAD • EUCLID, OHIO

be cut with one broach. Keyway depth is controlled by means of end nuts which move the blade back and forth in a taper milled slot in the broach body.

Check No. 11 on Reply Card for more Detail

All-Purpose Projector

Use of a totally enclosed screen on the miniature contour projector offered by Stocker & Yale, Marblehead, Mass., allows the unit to be used anywhere without interference from surrounding lighting conditions. Standard magnifications are 120, 90, 60, 45 and 30; values above

below and between these standards are available. Standard screen size is 6 inches square and the field of coverage at any magnification may be calculated by dividing the magnification value into 6 inches.

Application of the projector is usually made by means of a staging fixture which accepts the part to be checked in the most efficient manner for a rapid and accurate gaging operation. Several dimensions on a single part may be checked simultaneously. Such operations as fine assembly and adjustments may be watched as the operation is being performed.

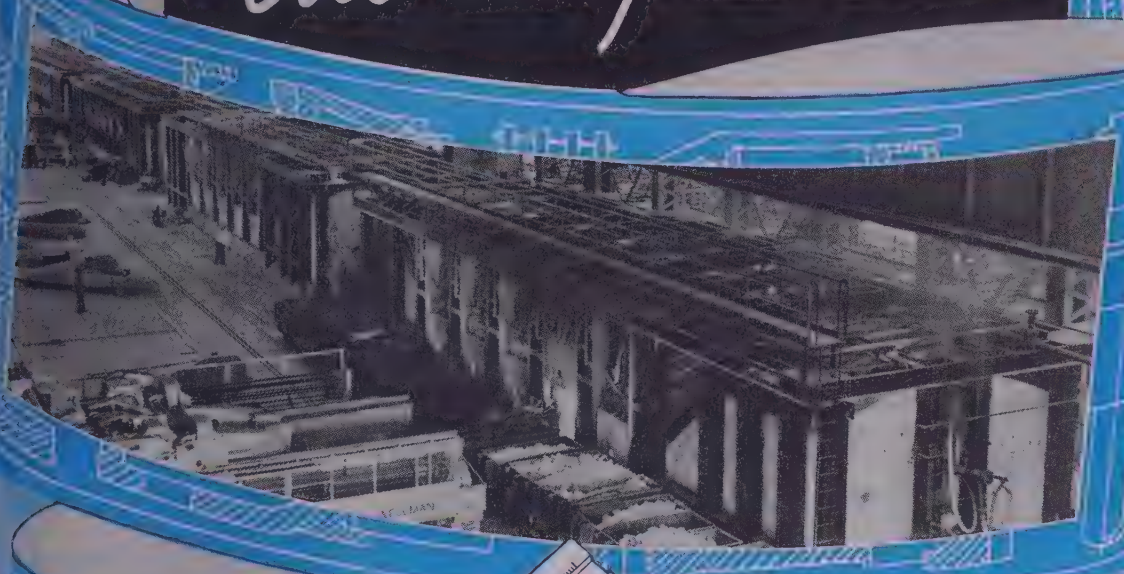
Check No. 12 on Reply Card for more Detail

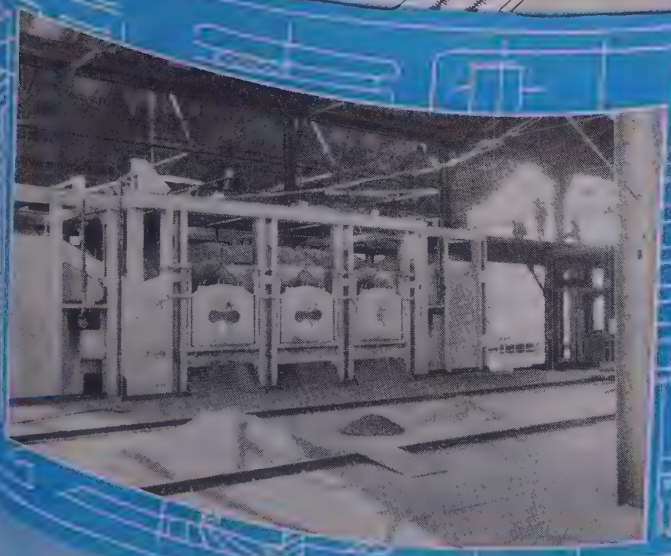
Time Saving Metric Indicator

An aid in cutting metric screw threads on lathes equipped with metric lead screws is the thread dial indicator designed by South Bend Lathe Works, 390 E. Madison St., South Bend 22, Ind. Attachment saves time when cutting long screw threads. Instead of reversing the lathe to return the cutting tool to the starting point, the half-nuts may be opened and the carriage moved quickly by hand. The graduated dial shows when to engage the half-nuts so the cutting tool will follow the original cut.

Several gears having different numbers of teeth are mounted on the

It's LOFTUS... All along the Line





Open Hearth FURNACES

For modern steel making, whether requirements call for a single furnace or a complete plant, it's "Loftus all along the line". Let Loftus Engineers solve your steel production problems.

TO PROPER DESIGN AND CONSTRUCTION. FOR DEPENDABLE AND ECONOMICAL PRODUCTION

610 SMITHFIELD ST. LOFTUS ENGINEERING Corporation PITTSBURGH, PA.

Designers and Builders Engineers, Consultants, Contractors

The New
XACTLINE
STRAIGHT LINE
TEMPERATURE CONTROL
For Use With
Pyrometer Controllers

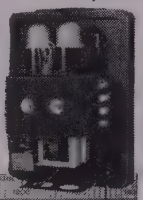
Anticipates
Temperature Change
Eliminates Overshoot
and Undershoot

Now with XACTLINE Straight Line Temperature Control you can increase the efficiency of your Pyrometer Control Instruments (either Millivoltmeter or Potentiometer Type) to an amazing degree. Now you can hold tolerances as close as 1/5°F. plus or minus and power "on-off" cycles as low as 3 seconds.

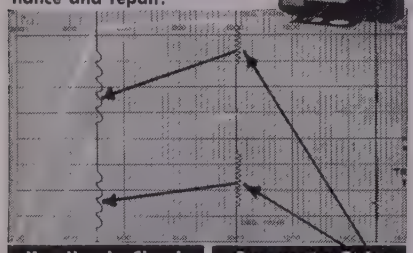
For XACTLINE, operating in the thermocouple circuit, ANTICIPATES the most minute heat variations on both heating and cooling cycles, thereby enabling your pyrometer controller to control far more closely than otherwise possible.

This *Anticipation Factor* means that XACTLINE causes the conventional pyrometer controller to respond to a millivoltage impulse up to 90% less than that normally required, (the controlling pyrometer functions *only* when the desired temperature range has *already been exceeded*).

XACTLINE is laboratory tested and adjusted . . . does not require readjustment or coordination with other controllers.



NO gears, cams, shafts, bearings or other rotating or sliding parts. Simple design eliminates usual maintenance and repair.



Xactline in Circuit | Pyrometer Only

PRECISE CONTROL FOR . . . Tempering-Drawing . . . Iso-Thermal Quenching . . . Al and Mg Treatment . . . Accurate Heat Treating . . . Sintering . . . Metallic Baths . . . Plastic Molding . . . and other operations . . . Price complete F. O. B. Factory . . . $79.50

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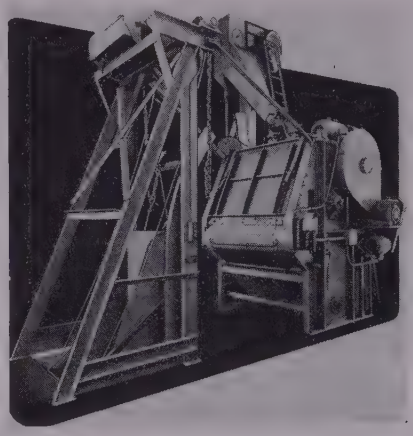
lower end of the thread dial shaft to provide for the various pitches of metric screw threads. A chart is supplied with the thread dial to show which gear and which graduations must be used for each pitch of metric screw thread. Device is available for 9-inch swing South Bend lathes having metric lead screws.

Check No. 13 on Reply Card for more Details

Versatile Blasting Machine

A variety of materials, including steel castings and forgings, may be cleaned with the 48 x 48-inch Wheelabrator Tumblast machine, manufactured by American Wheelabrator & Equipment Corp., Mishawaka, Ind. Machine has an endless chain apron



conveyor consisting of a series of steel flights, each of which has holes to allow spent abrasive to drop into the return conveying system. Tumblast heads guide the travel of the apron conveyor and determine the shape of the blast chamber.

Side frames are of heavy steel plate, reinforced with angles welded into place. Antifriction bearings are used throughout. A screen removes all refuse, chunks of scale and foreign material from the spent abrasive. Mechanical loaders can be supplied in either the floor level type or pit type.

Check No. 14 on Reply Card for more Details

Air Tool Handles Heavy Work

Rated up to 4-inch bolt size is the Slugger size 588 air impact tool announced by Ingersoll-Rand Company, Phillipsburg, N. J. Capable of handling maintenance and production work, it is designed for repair of heavy equipment and to save time in the manufacture of all types of machinery involving large studs, bolts and nuts.

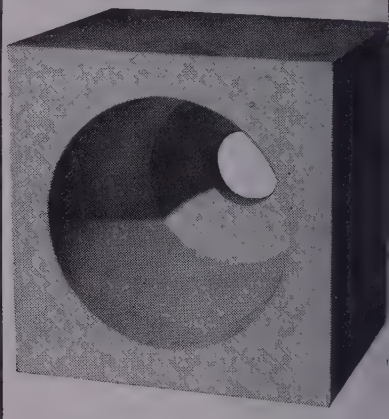
Tool weighs 215 pounds and has a free speed of 355 rpm, with 550 impacts per minute. Overall length from

MUL-8

A quality Mullite Refractory

Mul-8 contains a high percentage of Crystalline Mullite. Crystalline content has long been recognized as a controlling factor in the performance of mullite refractories.

PYROMETRIC CONE EQUIVALENT #38



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Standard shapes carried in stock.

Special shapes made to your specifications.

Dependable Refractories

REMMEY

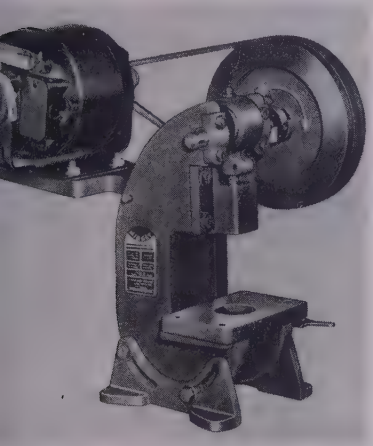
RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

oulder of anvil is 26⅝ inches. Side center distance of hammer case 4 inches. Standard equipment ides a safety live air handle with lependent reverse, suspension ring d dead handle.

ck No. 15 on Reply Card for more Details

nall Press for Heavy Work

Capacity of a small continuous avy-duty operation punch press of- red by Benchmaster Mfg. Co., 2952 Pico Blvd., Los Angeles, Calif., over 1 ton. Midget press has a ndard maximum stroke of ¾-inch



th a ¾-inch hole in the ram. orter strokes are available on ecial order. Approximate speed th a 1725 rpm motor is 290 strokes minute, a ¼-hp motor being commended.

Press employs a single trip safety chanism. The ram can be made repeat by removing a screw. Alloy el crankshaft is ¾-inch OD, ro- ing in replaceable bronze bushings. ess has a sliding key type clutch l a 20-pound flywheel. Die space bolster plate is 3¾-inches and oat depth is 2⅛ inches.

ck No. 16 on Reply Card for more Details

ntrolled Atmosphere Furnace

wide range of steels may be t treated under controlled atmos- ere conditions with the vertical ffle furnace designed by Surface nbustion Corp., Toledo 1, O. It is ipped with a gas-type, heat-resist- alloy muffle allowing atmosphere various heat treating processes h as gas carburizing, gas cyanid- and clean hardening to be em- yed.

Furnace provides the vertical life e of handling in which the charge, an Inconel basket, is transferred crane from a loading station into top charging furnace. Cover is sed hydraulically and swung to one side. Combustion efficiency is assured by automatic proportioning one-valve control burners which use any common gaseous fuel at low pressure.

Check No. 17 on Reply Card for more Details

• • •

DRAFTING MACHINE: Model D Wrigraph drafting machine mounts in the extreme right hand corner of the drawing board. Instrument, made by L. G. Wright Inc., Cleveland 21, O., permits free movement of scales over entire drawing area without interference.

Check No. 18 on Reply Card for more Details

COUNTING DEVICE: The new Duo-Cam counter, developed by Veeder-Root Inc., Hartford, Conn., is for size grading operations, counting number of pieces graded, on can closing machinery, etc. It can be supplied as a revolution ratchet counter, adding one count for each revolution of drive shaft in either direction; and as a ratchet with stops counters, adding one count for each

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Manufacturers of famous De-Sta-Co Toggle Clamps, Arbor Spacers, Shims, Shim Stock, Blower Housings, Refrigerator Compressor Valves.

oscillation of lever through an angle of 30 degrees.

Check No. 19 on Reply Card for more Details

SWEEPER: Plantman, a motorless floor sweeper that combines sweeping and collecting into one operation is announced by Handling Devices Co. Inc., Boston 16, Mass. Pushed at walking speed, machine picks up threads, sandings, tin, trash, scrap, dust, etc., and whisks them into a detachable aluminum hopper for ready disposal.

Check No. 20 on Reply Card for more Details

RECTIFIER: Model EPF 4304 selenium electroplating rectifiers, made by Electric Products Co., Cleveland 12, O., are offered in two types of control for use with only one rectifier. Power supply is 220 or 440 v, 3 phase, 60 cycles. Direct current output is 2000 amp at 6 v or 1000 amp at 12 v.

Check No. 21 on Reply Card for more Details

SHELL END MILL: Designed for facing or milling to a shoulder, a new type of shell end mill has been developed by Wendt-Sonis Co., Hannibal, Mo. Tool has more teeth in cutters allowing for increased table feed per minute and freedom of cutting action. Carbide insert overhang prevents diamond wheel from touching steel body when cutter is sharpened. Mills are available in sizes ranging from 1½ to 6 inches.

Check No. 22 on Reply Card for more Details

PUNCH PRESS SET: Northwestern Tool & Engineering Co., Dayton 3, O., offers punch press sets with the following size studs: ½-13, ⅝-11, ¾-10, ⅞-9 or 1-inch-8. Each set consists of four studs, four coupling nuts, and four flanged nuts encased in a plywood case.

Check No. 23 on Reply Card for more Details

SHELVING: Designated as Iron-Grip steel shelving, new shelving announced by Aurora Equipment Co., Aurora, Ill., is assembled without tools. Stud slips into a hole in shelf and into a keyhole in the upright; shelf is pressed down and assembly is complete.

Check No. 24 on Reply Card for more Details

GAGE: F. W. Dwyer Mfg. Co., Chicago, Ill., has developed a Magnehelic gage for the measurement of air pressure. It is efficient in checking furnace draft, testing filter resistance in ventilators and air conditioning equipment, measuring static pressure and air deliveries of fans and blowers, air velocity measurement from 400 to 10,000 fpm.

Check No. 25 on Reply Card for more Details

SPRINKLER HEADS: Viking Sprinkler Corp., Hastings, Mich., offers automatic, flush-type sprinkler heads that fit snugly against the ceiling. The deflector and suspension mechanism are completely concealed in a special recess inside the sprinkler's body. In case of fire, heat melts fusible link causing deflector to drop.

Check No. 26 on Reply Card for more Details

PIPE THREADER: Porta-Drive, a new portable pipe threader developed by Muncie Gear Works Inc., Muncie, Ind., threads up to 6-inch pipe in any position. A 20 to 1 gear reduction unit, it is driven by any ½-hp, heavy duty electric drill and attaches to any standard set of dies by specially designed adaptor yokes.

Check No. 27 on Reply Card for more Details

CLEANING MATERIAL: Designated as compound No. 33, a new acid-type cleaning and surface conditioning material is announced by Oakite Products Inc., New York 6, N. Y. It will remove rust, oxides, grease, oil and shop soil from metal surfaces and prepares ferrous metals and aluminum for adhesion of paint, lacquer and enamel finishes.

Check No. 28 on Reply Card for more Details

VALVES: McRae Valve Corp., Los Angeles 14, Calif., announces two Sentry valves for automatic line control in event of fire or other emergency. Automatic instant closing shut-off valve will close all gas, fuel oil or other lines. Instant opening valve automatically provides a deluge of water at full line capacity, directed to any critical area.

Check No. 29 on Reply Card for more Details

GASKET: Development of a flexible, all metal gasket for high pressure and high temperature applications is announced by Flexitallic Gasket Co., Camden, N. J. A new basic thickness of 0.125-inch in addition to the former standard thicknesses of 0.175 and 0.285-inch also is offered.

Check No. 30 on Reply Card for more Details

GENERATOR: A portable unit for generating steam electrically is offered by Cincinnati Metalcrafts Inc., Cincinnati, O. Unit is completely automatic as to pressures and water level control.

Check No. 31 on Reply Card for more Details

NUT: Locknut consists of a standard steel nut and a slightly elliptical retainer ring combined in a single unit. When locknut is applied, bolt forces heat treated alloy steel retainer back into circular shape, causing retainer to grip bolt threads and preventing rotation of nut. Made by Security Locknut Corp., Chicago 39, Ill., it is available in standard sizes of ⅜ to 2½ inches.

Check No. 32 on Reply Card for more Details

DUST MASK: All-Vision dust mask announced by Mine Safety Appliances Co., Pittsburgh 8, Pa., provides complete facial and respiratory protection against harmful dusts. Fitted with a lightweight, flexible all-rubber facepiece, mask conforms snugly to contours of the face.

Check No. 33 on Reply Card for more Details

SOLDERING TOOL: Known as Catalog No. 551, Mighty Midget soldering tool introduced by Luma Electric Equipment Co., Toledo 1, O., accommodates three different sizes of soldering electrodes, $\frac{3}{32}$, ⅛ and $\frac{5}{32}$-inch diameter in either single or double contact type construction. Available for operation on 115 or 230 v, 60 cycles, ac.

Check No. 34 on Reply Card for more Details

CONTROL DEVICE: A new speed control device, designated as Zero-Max, is introduced by Revco Inc., Minneapolis, Minn. It has an infinite speed variation from 0 to 4 to 1 ratio. Device can be mounted in any position and can handle loads up to 2 inch-pounds output torque.

Check No. 35 on Reply Card for more Details

COPYING DEVICE: Migel Distributing Co. Inc., New York 10, N. Y. is offering the portable Microfilmer made by Bolsey Corp. of America. It is an entirely self-contained unit with camera, lights, reader, stand and all accessories in a case.

Check No. 36 on Reply Card for more Details

TURNER: Model 1001-A Citco hydraulic diamond turner, made by Cleveland Industrial Tool Corp., Cleveland 17, O., is designed for use on Cincinnati centerless grinders. Turning operation is controlled by a valve which is automatically opened by the dresser unit. Turner is built to turn diamond three degrees enough to present a new sharp cutting edge on the diamond.

Check No. 37 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

Scale Control Unit

Aqua Electric Scale Control, Inc.—strated leaflet "Aqua Electric le Control Units" explains opera- of unit to control scale formation boilers, compressors, condensers, and bottle washers, air condi- ing systems and other equipment g water.

Mercury Switches

Minneapolis - Honeywell Regulator —16-page illustrated catalog No. 3 describes various types of mer- y switches for industrial applica- s. Two basic types discussed are rcury-to-electrode and mercury-to- rcury. Engineering data, selection les and specifications are given .

Totally Enclosed Motor

Crocker Wheeler Electric Mfg. Co. -page illustrated booklet "Crocker- eeler Sealedpower Motor" dis- ses features of totally enclosed -cooled motor which utilizes ex- al fins to increase heat dissipat- area. Available in ratings from o 60 hp and speeds from 3600 to rpm, these motors are particular- adaptable for use where dirt and are present.

Metal Cleaner

Oakite Products, Inc.—8-page il- rated folder No. F-7642 tells how rsCoat process effects improved ad- ion of paint to metal, prevents rosion of parts before painting and lizes underpaint corrosion when l finishes are scratched or dam- d.

Foundry Riddles

Buffalo Wire Works Co.—2-page strated form No. 591 explains fea- es of Buffalo foundry riddles. es to resist rust, abrasion and cor- on and for ordinary use are avail- in 16, 18 and 20-in. sizes and n different meshes.

Statistical Machine

International Business Machines p.—6-page illustrated form No. 5726-1 explains design features of I electronic statistical machine ch sorts, counts, accumulates, bal- es, edits and prints informational maries of facts recorded in IBM ds.

Expansion Joints

MagniLastic Div., Cook Electric Co. -page illustrated catalog 50 deals bellows-types expansion joints vacuum to pressures up to 1000 temperatures ranging from —300° 600° F and in standard pipe sizes ½ to 72 in. Requiring no pack- reinforcing rings or equalizing ers, joints are used in transmis- of steam, oils, gases, corrosive micals and other liquids.

80. Speed Reducers

Cone-Drive Div., Michigan Tool Co. —Illustrated bulletins Nos. 8962 and 8964 describe manner in which standard single reduction Cone-Drive speed reducers are combined to give double reduction units. First bulletin covers reducers with 2½ and 3-in. center distance primaries and 4 to 7-in. secondaries up to 9 hp and 53,700 lb-in. torque; second bulletin covers 4, 5 and 6-in. primaries and 7 to 12-in. secondaries up to 59 hp and 244,600 lb-in. torque.

81. Gas-Fume Respirator

Mine Safety Appliances Co.—2-page illustrated circular No. CR-23 is descriptive of multipurpose respirator which affords protection against mists, dusts, fumes and light concentrations of organic vapors and acid gases in any combination.

82. Industrial Floor Sweeper

Handling Devices Co.—4-page illustrated folder presents Plantman motorless industrial floor sweepers with sweeping widths of 20 to 28 in. Machine is pushed easily at walking speed and sweeps dirt and debris into detachable aluminum hopper for ready disposal. Rotating side brush allows sweeping up to walls.

83. Radiation Pyrometer

Bristol Co.—12-page illustrated bulletin P1242 describes new Pyrovisor radiation pyrometer. Also covered are accessories which adapt unit for use with furnaces and kilns for indicating, recording and controlling temperatures up to 4000° F.

84. Magnet Controller

Electric Controller & Mfg. Co.—4-page illustrated folder No. 905 describes new automatic-discharge controllers for all sizes, types and makes of lifting magnets. Manual-discharge type of controllers for small magnets are also detailed.

85. Electric Controls

Cutler-Hammer, Inc. — 1949-1950 edition of Merchandising Catalog illustrates and describes line of safety switches, service control and multi-breakers, motor controls and electrical specialties.

86. Ball & Roller Bearings

Link-Belt Co.—112-page illustrated book No. 2550 gives engineering data on complete line of ball and roller bearings. Construction features, list prices, weights, load ratings and all necessary dimensions for standard models and sizes are pointed out.

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87. Screen Cloth

Robins Conveyors Div., Hewitt-Robins Inc.—16-page illustrated bulletin No. 113-A on woven wire screen cloth presents tabular matter which enables reader to determine sizes of openings available for given diameter of wire. Also included are recommendations regarding wire diameter to select for processing such materials as sand, stone, coal, coke and other granular materials.

88. Sandslinger

Beardsley & Piper Div., Pettibone Mulliken Corp. — 36-page illustrated bulletin 310 fully describes nine models of stationary Sandslingers and Speedslingers and ramming method employed. Application photographs, specifications and detailed drawings cover each of three Sandslinger, four Speedslinger, Swingslinger and Hydra-Slinger models.

89. Large Spiral Pipe

Taylor Forge & Pipe Works—4-page illustrated bulletin 493 on Spiral-Weld pipe lists available sizes and thicknesses of this pipe which can be supplied quickly in any quantities. Outside diameters range from 6 to 36 in. Also tabulated are dimensions of light wall fittings and steel flanges for use with this pipe.

90. Agitated Gas Absorbers

Patterson Foundry & Machine Co. —16-page illustrated publication No. KSV-49-3 is reprint of paper by Kenneth S. Valentine, that discusses processes for which gas absorption apparatus of mechanical agitator type are best suited. Included are drawings of gas absorption systems with detailed examples of reactions for which they can successfully be used.

91. Flow Controls

Fischer & Porter Co.—24-page illustrated catalog 50 presents wide variety of primary and secondary flow instruments and control valves for all industries. Flow meters, transmitters, flow rate recorders, controllers and totalizers are discussed. New and improved Pneumatrol air-operated control mechanism and line of Valvrator air-operated diaphragm motor valves are described.

92. Drills and Reamers

Charles H. Besly & Co.—48-page illustrated catalog discusses high speed twist drills and reamers and presents complete specifications and prices on line. Included are all standard sizes and types of taper and straight shank regular, three-fluted and four-fluted drills as well as hand and machine chucking reamers.

93. Silicate Products

Diamond Alkali Co.—20-page illus trated booklet reviews ten standar liquid silicates of soda commerciall available. Data presented on eac grade summarizes its principal physi cal properties, industrial application and size and weight of package

94. Vibration Control

Korfund Co. — 4-page illustrate bulletin LK551 explains use of vi bration isolators. These units us steel springs as isolating mediu together with resilient snubbers t absorb lateral thrusts. Loading rang of six sizes of isolators is from 7 to 12,000 lb per unit.

95. Steel Fabrication

Watkins Inc. — 20-page illustrate catalog outlines steel fabrication serv ice offered by company and show typical products produced. These in clude custom-built precipitators, bul ble decks, fractionating towers, stain less plate assemblies, steel frames an buildings and tilt pots. Equipment an facilities are described.

96. Forging Manipulator

Edgar E. Brosius Co.—7-page il lustrated catalog section 3 contain detailed drawings giving dimension and essential data on auto-floor ma nipulators which handle forging weighing from 2000 to 20,000 l These highly maneuverable trackles machines can be used in any type o plant.

97. Grinding Wheels

Norton Co.—6-page illustrated man ual is entitled "This Abrasive Ca Really Cut Grinding Costs." It dis cusses 32 Alundum abrasive forme in electric furnace in fluid matri which is used for surface, tool in ternal, centerless and cylindrica grinding wheels which are supplie in all standard sizes and shapes.

98. Trimming Dies

Steel Products Engineering Co.— 12-page illustrated technical manua "Brehm Trimming Dies" shows typi cal products and dies used for fla edge trimming and notching of draw shells in one stroke of press.

99. Automatic Presses

Danly Machine Specialties, Inc.— 16-page illustrated booklet on heavy duty Autofeed presses presents cata log information and specifications o complete line and contains detaile information on mechanical feature including new clutch. Presses covere range in capacity from 50 to 800 ton

100. Metallizing Service

Metallizing Inc.—10-page illustra ed bulletin "Contract Metallizing shows typical products which hav been metallized. Service includes a plication of corrosion and erosion r sistant coatings as well as resurfa ing and refinishing of worn part

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10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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Market Summary

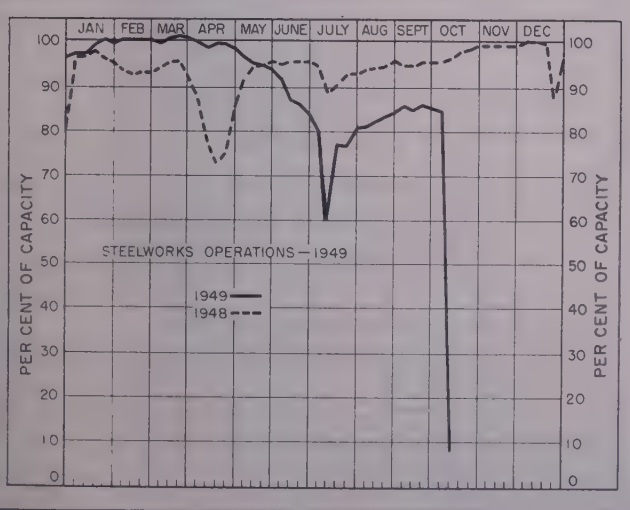
FULL IMPACT of the steel strike will be felt in two to three weeks. If the walkout lasts that long it will hit the economy with the force of a Caribbean hurricane. Metalworking shops will be forced to suspend wholesale for lack of steel. Some already are curtailing and their ranks will be augmented daily as steel stocks shrink. Consumers' inventories, estimated to average 30-days' supply at strike's start, are inadequate to support economical fabricating that long. They will quickly become unbalanced at today's relatively active consumption, forcing widespread shutdowns even though stock bins may not be completely stripped. Predictions are heard the strike may last 30 days or more. The 1946 walkout lasted about a month and consumers were desperate for metal when it ended. The situation could prove as serious this time unless the industry is quickly taken off the ropes.

PRODUCTION—Iron and steel operations are not choked off 100 per cent by the work stoppage. The ingot rate nose-dived to an estimated 7.5 per cent of capacity against 85 per cent just prior to the strike. But a trickle of production is coming from a surprisingly large number of steelworks still operating. Most of these are small. They include several medium-sized producers with primary capacity who have met the United Steelworkers' demands, some whose union contracts have not expired, and others under contract with independent unions. Producers of cold-finished bars, tool and stainless steels, and specialties, in the main, are operating. Some of these, especially cold-drawers, will be forced down. Pig iron production is off but a number of merchant iron producers are operating under indefinite extensions of union contracts. Fabricating industry has not been struck to any major extent. The union is disposed to avoid walkouts here. It prefers to let plants close for lack of steel, opening the way for workers to obtain unemployment insurance. In most states strikers are not eligible.

DISTRICT RATES—Steelmaking plunged overnight to 7.5 per cent of capacity, operating depths seldom experienced before. In most, but not all districts, operations are riding close to bottom. In St. Louis the rate is unchanged at 84.5 per cent, this area being singularly unscathed. The New England area is off 19 points to 52 per cent, Cincinnati, 40 points to 52, Wheeling, 32½ to 59, Pittsburgh, 78 to 3.5, Chicago, 87 to 6, eastern Pennsylvania, 72½ to 7½, Birmingham, 96 to 4, and in the West, 57 points to 20 per cent.

DEMAND—With mill shipments cut off, metalworking shops are turning in desperation to the warehouses to fill requirements. Generally, distributors are well stocked but are declining most new business except that from regular customers. In some products they are rationing tonnage. Here and there reports are heard of the reappearence of gray market offerings at premium prices. Mill sales offices are advising consumers to get orders on mill books for delivery after the strike ends. A rush of buyers seeking to replenish inventories is anticipated resulting in a severe supply pinch. Deliveries of hot-rolled bars, plates, shapes, sheets and strip, among other products, may be extended four to six weeks in the opinion of sellers. Extensions may be even longer depending upon the length of the strike and the speed with which production can be resumed once the walkout is over.

PRICES—STEEL's weighted index on finished steel holds unchanged at 152.52. The arithmetical price composites also are unchanged and compare with the like week a year ago as follows: Finished steel, $91.55 and $95.05; No. 2 foundry iron, $46.10 and $46.32; malleable iron, $47.27 and $46.99; basic iron, $45.60 and $45.88. Reflecting weakness in the Chicago district, the price composite on steelmaking scrap eased to $27.25 from $27.58 the preceding week and compared with $43.25 a year ago.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 8	Change	Same Week 1948	Same Week 1947
Pittsburgh	3.5	—78	95.5	103
Chicago	6	—85*	97.5	95
Eastern Pa.	7.5	—72.5	94	91.5
Youngstown	0	—94	104	92
Wheeling	59	—32.5	90	93.5
Cleveland	0	—83.5*	92	92.5
Buffalo	0	—79.5	104	88.5
Birmingham	4	—96	100	99
New England	52	—19	87	84
Cincinnati	52	—40	103	87
St. Louis	84.5	None	91.5	80
Detroit	0	—52*	101	88
Western	20	—57	..	..
Estimated national rate	7.5	—77.5	97	95.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *From revised rate.

News Summary—P. 85 *Engineering News—P. 115*

Composite Market Averages

	Oct. 6 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT.....	$91.55	$91.55	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.32	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	46.99	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	45.88	23.00
Steelmaking Scrap, GT..	27.25	27.58	25.17	43.25	17.08

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 6 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pitts.	3.35	3.35	3.35	3.45	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.83	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pitts.	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.50	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40–60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.59	3.71	2.15
Sheets, H.R., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pitts.	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pitts.	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pitts.	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pitts.	4.00	4.00	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pitts.	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pitts.	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pitts.	$7.75	$7.75	$7.75	$6.80	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Wire rods, 7/32-⅜", Pitts. ..	3.40	3.40	3.40	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago.....	46.50	46.50	46.50	43.00-46.50	24.00
No. 2 Fdry, Valley.....	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.67	25.84
No. 2 Fdry, Birmingham..	39.38	39.38	39.38	43.38	20.38
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	43.50-46.50	24.00
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$29.75	$29.75	$27.00	$42.75	$16.75
No. 1 Heavy Melt. E. Pa..	25.00	25.00	24.00	45.25	15.50
No. 1 Heavy Melt. Chicago	27.00	28.00	24.50	41.75	18.75
No. 1 Heavy Melt. Valley..	31.25	31.25	26.50	42.75	20.00
No. 1 Heavy Melt. Cleve...	26.50	26.50	23.00	42.25	17.00
No. 1 Heavy Melt. Buffalo.	28.25	28.25	26.25	48.25	17.50
Rails, Rerolling, Chicago..	41.50	41.50	38.50	64.50	22.25
No. 1 Cast, Chicago.....	41.50	41.50	40.50	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis.....	9.25	10.00	10.00	15.00	8.25
Lead, St. Louis.....	14.05	14.55	14.925	19.30–35	6.35
Tin, New York	96.00	96.00	103.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	16.00–17.00	15.00
Antimony, Laredo, Tex. ..	38.50	38.50	38.50	35.00	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.13	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	....
Woodward,Ala. W15	38.88	39.38	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y. W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y. T9	....	46.50	47.00	....
Boston,del.	55.26	55.76	56.20	....
Rochester,N.Y.,del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W14	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
So.Chicago,Ill. Y1	46.00	46.50	46.50	....
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Lorain,O. N3	46.00	....	....	47.00
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg., del.	....	54.20	....	....
LosAngeles,SanFrancisco,del.	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del.(incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
LoneStar,Tex. L6	46.00	*46.50	....	....
Gulf ports,del.	50.50	51.00	....	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts.N&S sides,Ambridge, Aliquippa,del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	46.00	46.50	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Struthers,O. S16	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

* Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson,O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SIVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk,Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2..	82.00
Wenatchee,Wash. OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.09
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices on Oct. 6, 1949; cents per lb. unless otherwise noted. Code numbers following mill points indicate producing company, key on next page.

INGOTS, Carbon, Forging (NT)

Detroit R7 .....$50.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)

Detroit R7 .....$51.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ...51.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Bessemer,Pa. C3 .....$52.00
Clairton,Pa. C3 .....52.00
Johnstown,Pa. A3 ..57.00
Lisbon,Ala. T2 .....52.00
Fairfield,Ala. T2 .....52.00
Pittsburg,Calif. K1 ....71.00
Gary,Ind. C3 .....52.00
Johnstown,Pa. B2 ....52.00
Lackawanna,N.Y. B2 ..52.00
Munhall,Pa. C3 .....52.00
Sharon,Pa. S3 .....52.00
So.Chicago,Ill. C3 ....52.00
So.Duquesne,Pa. C3 ...52.00

Carbon, Forging (NT)

Bessemer,Pa. C3 .....$61.00
Buffalo R2 .....61.00
Canton,O. R2 .....61.00
Clairton,Pa. C3 .....61.00
Cleveland R2 .....61.00
Conshohocken,Pa. A3 ..63.00
Detroit R7 .....61.00
Gisley,Ala. T2 .....61.00
Fairfield,Ala. T2 .....61.00
Fontana,Calif. K1 ....80.00
Gary,Ind. C3 .....61.00
Geneva,Utah G1 .....61.00
Houston,Tex. S5 .....69.00
Ind.Harbor,Ind. I-2 ...61.00
Johnstown,Pa. B2 ....61.00
Lackawanna,N.Y. B2 ..61.00
Munhall,Pa. C3 .....61.00
So.Duquesne,Pa. C3 ...61.00
So.Chicago,Ill. C3, R2..61.00
Warren,O. C17 .....61.00

Alloy (NT)

Bethlehem,Pa. B2 ....$63.00
Buffalo R2 .....63.00
Canton,O. R2, T7 .....63.00
Conshohocken,Pa. A3 ..65.00
Detroit R7 .....63.00
Fontana,Calif. K1 ....82.00
Gary,Ind. C3 .....63.00
Houston,Tex. S5 .....71.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2 ..63.00
Massillon,O. R2 .....63.00
Midland,Pa. C18 .....63.00
Munhall,Pa. C3 .....63.00
Canton,Pa. S3 .....63.00
Chicago,Ill. C3, R2..63.00
Duquesne,Pa. C3 ...63.00
Warren,O. C17 .....63.00

RAIL BARS (NT)

Bessemer,Pa. J5 .....$63.00
Buffalo,N.Y. R2 .....63.00
Chicago Hts.,Ill. I-2 ..63.00
Ensley,Ala. T2 .....63.00
Fairfield,Ala. T2 .....63.00
Fontana,Calif. K1 ....63.00
Gary,Ind. C3 .....63.00
Houston,Tex. S5 .....63.00
Ind.Harbor,Ind. I-2 ...63.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2 ..63.00
Lebanon,Pa. S3 .....63.00
Minnequa,Colo. C10 ...63.00
Munhall,Pa. C3 .....63.00
Niles,Calif. P1 .....63.00
Pittsburg,Calif. K1 ....63.00
Portland,Oreg. O4 .....63.00
Seattle B3 .....63.00
So.Chicago,Ill. C3 ....63.00
So.Duquesne,Pa. C3 ...63.00
Sparrows Point,Md. B2 ..63.00
Steubenville,O. W10 ....63.00
Struthers,O. Y1 .....63.00
Torrance,Calif. C11 ....63.00
Youngstown C3, R2 ....63.00

RAIL BARS, SEAMLESS TUBE (NT)

Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Ind.Harbor,Ind. I-2 ....76.00
Million,O. R2 .....76.00
Chicago,Ill. R2 ....76.00

SKELP

Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.25
Warren,O. R2 .....3.25
Youngstown C3, R2 ....3.25

SKELP ENDS

Alabama City,Ala. R2 ..3.40
Cleveland A7 .....3.40
Donora,Pa. A7 .....3.40
Fairfield,Ala. T2 .....3.40
Gary,Ind. C3 .....3.40
Houston,Tex. S5 .....3.95
Ind.Harbor,Ind. Y1 ....3.40
Johnstown,Pa. B2 ....3.40
Munhall,Pa. C3 .....3.40
Niles,Ill. A7 .....3.40
Pittsburgh J5 .....4.20
Sharon,Pa. P7 .....3.40
Youngstown,Calif. C11 ....4.05
Youngstown,O. P12 ....3.40
Chicago,Ill. R2 .....3.40
Follansbee,W.Va. P3 ....3.40
Lackawanna,N.Y. B2 ....3.50
Pittsburg,Ill.(1) N15 ....3.40
Rankers,O. Y1 .....3.40
Spruce,Calif. C11 ....4.20
Worcester,Mass. A7 ....3.70

STRUCTURALS
Wide Flange

Bethlehem,Pa. B2 .....3.30
Lackawanna,N.Y. B2 ..3.30
Munhall,Pa. C3 .....3.20
So.Chicago,Ill. C3 .....3.20

H.-S. Low-Alloy

Aliquippa,Pa. J5 .....4.95
Bessemer,Ala. T2 .....4.95
Bethlehem,Pa.(14) B2 ..5.05
Clairton,Pa. C3 .....4.95
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 ....6.10
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I-2, Y1 .4.95
Johnstown,Pa. B2 ....5.05
Lackawanna,N.Y. B2 ...5.05
Munhall,Pa.(14) C3 ....4.95
So.Chicago,Ill.(14) C3 ..4.95
Struthers,O. Y1 .....4.95

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 .....3.25
Bessemer,Ala. T2 .....3.25
Bethlehem,Pa. B2 .....3.30
Clairton,Pa. C3 .....3.25
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....3.80
Gary,Ind. C3 .....3.25
Geneva,Utah G1 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I-2 ....3.25
Johnstown,Pa. B2 .....3.30
KansasCity,Mo. S5 ....3.85
Lackawanna,N.Y. B2 ...3.30
LosAngeles B3 .....3.85
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.25
Niles,Calif.(22) P1 ....3.97
Portland,Oreg. O4 .....3.90
Seattle B3 .....3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 ....3.80
Torrance,Calif. C11 ....3.85
Weirton,W.Va. W6 ....3.25

Alloy Stand. Shapes

Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 ....4.05

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 .....4.05
Lackawanna,N.Y. B2 ....4.05
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05
Weirton,W.Va. W6 .....4.05

PLATES Carbon Steel

AlabamaCity,Ala. R2 ...3.40
Aliquippa,Pa. J5 .....3.40
Ashland,Ky.(15) A10 ...3.40
Bessemer,Ala. T2 .....3.40
Clairton,Pa. C3 .....3.40
Claymont,Del. W16 ....3.50
Cleveland J5, R2 .....3.40
Coatesville,Pa. L7 .....3.50
Conshohocken,Pa. A3 ...3.50
Ecorse,Mich. G5 .....3.65
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Harrisburg,Pa. C5 .....3.50
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2, Y1 .3.40
Johnstown,Pa. B2 .....3.40
Lackawanna,N.Y. B2 ...3.40
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.40
Pittsburgh J5 .....3.40
Seattle B3 .....4.30
Sharon,Pa. S3 .....3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 ..3.40
Steubenville,O. W10 ....3.40
Warren,O. R2 .....3.40
Weirton,W.Va. W6 .....3.40
Youngstown C3, Y1 ....3.40

PLATES (Universal Mill)

Fontana,Calif. K1 .....4.30

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ..4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES, Ingot Iron

Ashland,cl(15) A10 ....3.65
Ashland,lcl(15) A10 ....4.15
Cleveland,cl R2 .....3.65
Warren,O.,cl R2 .....3.65

PLATES, Wrought Iron

Economy,Pa. B14 .....7.85

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland J5, R2 .....5.20
Conshohocken,Pa. A3 ...5.20
Ecorse,Mich. G5 .....5.45
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....5.80
Gary,Ind. C3 .....5.20
Geneva,Utah G1 .....5.20
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I-2, Y1 .5.20
Johnstown,Pa. B2 .....5.20
Munhall,Pa. C3 .....5.20
Pittsburgh J5 .....5.20
Sharon,Pa. S3 .....5.65
So.Chicago,Ill. C3 .....5.20
SparrowsPoint,Md. B2 ..5.20
Warren,O. R2 .....5.20
Youngstown Y1 .....5.20

FLOOR PLATES

Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ...3.35
Aliquippa,Pa. J5 .....3.35
Alton,Ill.(1) L1 .....3.35
Ashland,Ky.(17) A10 ..3.35
Atlanta,Ga. A11 .....3.50
Bessemer,Ala. T2 .....3.35
Buffalo R2 .....3.35
Canton,O. R2 .....3.35
Clairton,Pa. C3 .....3.35
Cleveland R2 .....3.35
Ecorse,Mich. G5 .....3.55
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Midland,Pa. C18 .....3.35
Milton,Pa. B6 .....3.35
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.05
N.Tonawanda,N.Y. B11.3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.10
S.Chicago C3, R2, W14..3.35
So.Duquesne,Pa. C3 ....3.35
S.SanFran.,Cal. B3 ....4.10
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Weirton,W.Va. W6 ....3.35
Youngstown C3, R2 ....3.35

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 .....4.00
Ambridge,Pa. W18 .....4.00
BeaverFalls, M12, R2...4.00
Buffalo B5 .....4.00
Camden,N.J. P13 .....4.48
Carnegie,Pa. C12 .....4.00
Chicago W18 .....4.00
Cleveland A7, C20 .....4.00
Cumberland,Md. C19 ...3.95
Donora,Pa. A7 .....4.00
Ecorse,Mich. G5 .....4.30
Elyria,O. W8 .....4.00
FranklinPark,Ill. N5 ....4.00
Gary,Ind. R2 .....4.00
Hammond,Ind. L2, M13..4.00
Hartford,Conn. R2 .....4.40
Harvey,Ill. B5 .....4.00
Indianapolis M13 .....4.20
LosAngeles R2 .....5.40
Mansfield,Mass. B5 ....4.40
Massillon,O. R2, R8.....4.00
Midland,Pa. C18 .....4.00
Monaca,Pa. S17 .....4.00
Newark,N.J. W18 .....4.40
Plymouth,Mich. P5 ....4.25
Pittsburgh J5 .....3.95
Putnam,Conn. W18 .....4.40
Readville,Mass. C14 ....4.40
St.Louis,Mo. M5 .....4.35
So.Chicago,Ill. W14 ....4.00
SpringCity,Pa.(5) K3 ..4.48
Struthers,O. Y1 .....4.00
Waukegan,Ill. A7 .....4.00
Youngstown F3, Y1 .....4.00

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 .....3.35
Atlanta,Ga. A11 .....3.50
Bethlehem,Pa.(2) B2 ..3.55
Johnstown,Pa. B2 .....3.35
Lackawanna,N.Y. B2 ..3.35
Niles,Calif. P1 .....4.05
Pittsburgh(23) J5 .....3.35
Portland,Oreg. O4 .....4.10
SanFrancisco S7 .....4.05
Weirton,W.Va. W6 .....3.35

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 .....4.00
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....4.00
Youngstown C3 .....4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.10
Bessemer,Ala. T2 .....5.10
Bethlehem,Pa. B2 .....5.10
Clairton,Pa. C3 .....5.10
Cleveland R2 .....5.10
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.10
Fontana,Calif. K1 .....6.15
Gary,Ind. C3 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
Pittsburgh J5 .....5.10
So.Duquesne,Pa. C3 ....5.10
Struthers,O. Y1 .....5.10
Youngstown C3 .....5.10

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....3.75
Buffalo R2 .....3.75
Canton,O. R2, T7 .....3.75
Clairton,Pa. C3 .....3.75
Ecorse,Mich. G5 .....4.05
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....3.75
Houston,Tex. S5 .....4.15
Ind.Harbor,Ind. I-2, Y1..3.75
Johnstown,Pa. B2 .....3.75
KansasCity,Mo. S5 .....4.35
Lackawanna,N.Y. B2 ...3.75
LosAngeles B3 .....4.80
Massillon,O. R2 .....3.75
Midland,Pa. C18 .....3.75
S.Chicago C3, R2, W14..3.75
So.Duquesne,Pa. C3 ....3.75
Struthers,O. Y1 .....3.75
Warren,O. C17 .....3.75
Youngstown C3 .....3.75

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 .....4.65
Ambridge,Pa. W18 .....4.65
BeaverFalls,Pa. M12 ...4.65
Bethlehem,Pa. B2 .....4.65
Buffalo B5 .....4.65
Canton,O. R2, T7 .....4.65
Carnegie,Pa. C12 .....4.65
Chicago W18 .....4.65
Cleveland A7, C20 .....4.65
Donora,Pa. A7 .....4.65
Elyria,O. W8 .....4.65
Gary,Ind. R2 .....4.65
Hammond,Ind. L2, M13..4.65
Hartford,Conn. R2 .....4.95
Harvey,Ill. B5 .....4.65
Indianapolis M13 .....4.85
Lackawanna,N.Y. B2 ..4.65
Mansfield,Mass. B5 ....4.95
Massillon,O. R2, R8.....4.65
Midland,Pa. C18 .....4.65
Monaca,Pa. S17 .....4.65
Newark,N.J. W18 .....4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 .....4.65
Waukegan,Ill. A7 .....4.65
Worcester,Mass. A7 ....4.95
Youngstown F3, Y1 ....4.65

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 ...3.35
Alton,Ill.(6) L1 .....3.35
Atlanta,Ga.(7) A11 ....3.50
Buffalo R2 .....3.35
Cleveland R2 .....3.35
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Ft.Worth,Tex.(7) T4 ...4.33
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.05
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle,Wash. B3, N14..4.10
So.Chicago,Ill. R2 .....3.35
So.Duquesne,Pa. C3 ....3.35
So.SanFrancisco B3 ....4.10
SparrowsPoint,Md. B2 ..3.35
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Youngstown C3, R2 ....3.35

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7 ..4.50
Johnstown,¼-1" B2 ....4.25
LosAngeles B3 .....5.00
Pittsburgh J5 .....4.25
Seattle B3, N14 .....5.00
So.SanFrancisco B3 ....5.00
SparrowsPt.,1⅜-1¼" B2..4.83
SparrowsPt.,¼-1" B2 ...4.25

RAIL STEEL BARS

Chicago Hts.,Ill.(3) I-2..3.25
Huntgtn,W.Va.(3,4) W7..3.35
Moline,Ill.(3) R2 .....3.35
Williamsport(2,3) S19 ..3.35
Williamsport(4) S19 ....3.85

BARS, Wrought Iron

Economy,Pa.(S.R.)B14..9.50
Economy,Pa.(D.R.)B14.11.00
Economy(Stablt) B14 ..11.30
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ...11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky.(17) A10 ..3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 ...3.25
Ashland,Ky.(8) A10 ...3.25
Butler,Pa. A10 .....3.25
Cleveland J5, R2 .....3.25
Conshohocken,Pa. A3 ..3.35
Ecorse,Mich.(8) G5 ....3.45
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....4.15
Gary,Ind. C3 .....3.25
Ind.Harbor,Ind. I-2, Y1..3.25
Irvin,Pa. C3 .....3.25
KansasCity,Mo. S5 .....6.25
Kokomo,Ind. C16 .....3.35
Lackawanna,N.Y. B2 ...3.25
Munhall,Pa. C3 .....3.25
Pittsburg,Calif. C11 ....3.95
Pittsburgh J5 .....3.25
Sharon,Pa. S3 .....3.25
So.Chicago,Ill. W14 ....3.25
SparrowsPoint,Md. B2 ..3.25
Steubenville,O. W10 ....3.25
Torrance,Calif. C11 ....3.95
Warren,O. R2 .....3.25
Weirton,W.Va. W6 ....3.25
Youngstown C3, Y1 ....3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 ...4.40
Dover,O. R1 .....5.00
Fairfield,Ala. T2 .....4.15
Ind.Harbor,Ind. I-2 ....4.15
Kokomo,Ind. C16 .....4.25
Mansfield,O. E5 .....4.15
Niles,O. N12, M4 .....4.15
Torrance,Calif. C11 ....5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.00
Cleveland J5 R2 .....4.00
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.00
Follansbee,W.Va. F4 ...4.00
Fontana,Calif. K1 .....4.90
Gary,Ind. C3 .....4.00
GraniteCity,Ill. G4 ....4.20
Ind.Harbor,Ind. I-2, Y1..4.00
Irvin,Pa. C3 .....4.00
Lackawanna,N.Y. B2 ...4.00
Middletown,O. A10 .....4.00
Pittsburg,Calif. C11 ....4.95
Pittsburgh J5 .....4.00
SparrowsPoint,Md. B2 ..4.00
Steubenville,O. W10 ....4.00
Warren,O. R2 .....4.00
Weirton,W.Va. W6 .....4.00
Youngstown Y1 .....4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5, R2 .....6.05
Ecorse,Mich. G5 .....6.25
Fontana,Calif. K1 .....6.95
Gary,Ind. C3 .....6.05
Ind.Harbor,Ind. I-2, Y1..6.05
Irvin,Pa. C3 .....6.05
Lackawanna,N.Y. B2 ...6.05
Pittsburgh J5 .....6.05
Sharon,Pa. S3 .....6.05
SparrowsPoint,Md. B2 ..6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Youngstown Y1 .....6.05

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. C3	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
So.Chicago,Ill. C3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	5.40
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.40
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	4.95

SHEETS, Zincgrip No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2	5.15
Niles,O. R2	5.15
Weirton,W.Va. W6	5.00

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16 Flat

	Alloy	FE
Ashland A10	5.00	...
Canton,O. R2	5.05	5.50
Fairfield,Ala. T2	5.00	5.35
Gary C3	5.00	5.35
GraniteCity G4	5.40	5.70
Irvin C3	5.00	5.35
Kokomo C16	5.40	...
MartinsFy,O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2	5.00	...
Torrance,Cal. C11	5.75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10	5.25

SHEETS, Well Casing

Torrance,Calif. C11	4.75
Youngstown C3	3.75

SHEETS, Aluminized

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville, O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.75
Gary,Ind. C3	6.65
Ind.Harbor,Ind. I-2	6.65
Irvin,Pa. C3	6.65
Weirton,W.Va. W6	6.65
Yorkville,O. W10	6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Gary,Ind. C3	8.95
Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.50
Cleveland R2	3.85
Ind.Harbor,Ind. I-2	3.50
Warren,O. R2	3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.60
Middletown,O. A10	4.50
Warren,O. R2	4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.95

SHEETS, Zincgrip No. 10 Flat, Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.40
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.75
Fairfield,Ala. T2	5.85
Gary,Ind. C3	5.75
GraniteCity,Ill. G4	5.95
Ind.Harbor,Ind. I-2, Y1	5.75
Irvin,Pa. C3	5.75
Niles,O. R2	5.75
Pittsburg,Calif. C11	6.50
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.75
Weirton,W.Va. W6	5.75
Yorkville,O. W10	5.75

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.50	$7.75
Fairfield,Ala. T2	7.60	7.85
Gary C3	7.50	7.75
Gran.City,Ill. G4	7.70	7.95
Ind.Harb. I-2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11	8.25	8.50
Sp.Pt.,Md. B2	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10.	7.50	7.75

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.60

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky. A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Cleveland J5	3.25
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary, Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Pittsburgh J5	3.25
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.5
Sharon,Pa. S3	9
Worcester,Mass. A7	9
Youngstown C8	9

STRIP, Cold-Rolled Carbon

Berea,O. C7	6
Bridgeprt,Conn.(10) S15	4
Butler,Pa. A10	4
Chicago,Ill. T6	4
Cleveland A7, J5	4
Detroit D2, D3	4
Detroit M1	4
Dover,O. G6	4
Ecorse,Mich. G5	4
Follansbee,W.Va. F4	4
Fontana,Calif. K1	4
Ind.Harbor,Ind. I-2	4
Lackawanna,N.Y. B2	4
LosAngeles C1	5
Mattapan,Mass.(21) T6	4
Middletown,O. A10	4
NewBritain(10) S15	4
New Castle,Pa. B4, E5	4
NewHaven,Conn. A7, D2	4
NewKensington,Pa. A6	4
NewYork W3	5
Pawtucket,R.I.(11) N8	4
Pawtucket,R.I.(21) N8	4
Pawtucket,R.I. R3	4
Pittsburgh J5	4
Riverdale,Ill. A1	4
Sharon,Pa. S3	4
SparrowsPoint,Md. B2	4
Trenton,N.J.(13) R5	4
Wallingford,Conn. W2	4
Warren,O. R2, T5	4
Weirton,W.Va. W6	4
Youngstown C8, Y1	4

STRIP, Cold-Rolled, High-strength Low-Alloy

Cleveland A7, J5	6
Dover,O. G6	6
Ecorse,Mich. G5	6
Fontana,Calif. K1	6
Lackawanna,N.Y. B2	6
Pittsburgh J5	6
Sharon,Pa. S3	6
SparrowsPoint,Md. B2	6
Warren,O. R2	6
Weirton,W.Va. W6	6
Youngstown Y1	6

STRIP, Electro Galvanized

Weirton,W.Va. W6	4
Youngstown C8	4

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ill. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I-2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7.20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C	1.0-1.3
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.
Bristol,Conn. W1	...	...	6.40	8.35	...
Carnegie,Pa. S18	...	5.50	6.10	8.05	10.
Chicago T6	4.25	5.65	6.25	8.20	10.
Cleveland A7	4.00	5.50	6.10	8.05	10.
Dover,O. G6	4.00	5.50	6.10	7.85	10.
Harrison,N.J. C18	...	...	6.40	8.35	10.
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.
NewBritn.,Conn.(10) S15	4.00	5.50	6.10	8.05	10.
NewCastle,Pa. B4	4.00	5.50	6.10	...	...
NewYork W3	...	5.80	6.40	8.35	10.
Pawtucket,R.I. N8 Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.
Worcester,Mass.Base	4.50	5.80	6.40	8.35	10.
Sharon,Pa. S3	4.00	5.50	6.10	8.05	10.
Trenton,N.J. R5	...	5.80	6.40	8.35	10.
Union,N.J. H6	4.40	6.35	6.35	8.30	10.
Wallingford,Conn. W2	4.50	5.80	6.40	8.05	10.
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.
Worcester,Mass, T6	4.50	5.80	6.40	8.35	10.
Youngstown C8	4.50	5.50	6.10	8.05	10.

SHEET SILICON (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	5.45	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I-2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	...	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	....
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel Co.
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cld. Roll. Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Co.
D4 Disston & Sons, Henry

E1 Eastrn. Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co. Inc.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.

J1 Jackson Iron & Steel C
J3 Jessop Steel Co.
J4 Johnson Steel & Wire C
J5 Jones & Laughlin Steel
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.

IP, Hot-Rolled, igh-Strength Low-Alloy

semer,Ala. T2 .....4.95
veland J5 .....4.95
rse,Mich. G5 .....5.15
rfield,Ala. T2 .....4.95
tana,Cal. K1 .....6.64
y,Ind. C3 .....4.95
.Harb,Ind. I-2, Y1 ..4.95
kawanna,N.Y. B2 ...4.95
tsburgh J5 .....4.95
ron,Pa. S3 .....4.95
rrowsPoint,Md. B2 ..4.95
rren,O. R2 .....4.95
rton,W.Va. W6 ....4.95
ngstown C3, Y1 ....4.95

HT COOPERAGE HOOP

anta A11 .....3.60
erdale,Ill. A1 .....3.60
ron,Pa. S3 .....3.60
ngstown C3 .....3.60

RE, MB Spring, High-Carbon

quippa,Pa. J5 .....5.55
on,Ill(1) L1 .....5.55
tonville,Ill.(19) K4 ..5.55
ffalo W12 .....5.55
veland A7 .....5.55
nora,Pa. A7 .....5.55
uth A7 .....5.55
toria,O. S1 .....5.55
nstown,Pa. B2 .....5.55
Angeles B3 .....6.50
nessen,Pa. P7 .....5.55
mer,Mass. W12 ....5.85
tsburg,Calif. C11 ....6.50
tsmouth,O. P12 ....5.55
Chicago,Ill. R2 ....5.55
rrowsPoint,Md. B2 ..5.35
uthers,O. Y1 .....5.55
nton, N.J. A7, R5 ...5.85
ukegan,Ill. A7 .....5.55
rcester A7,J4,T6,W12.5.85

RE, Cold-Rolled Flat

cago T6 .....5.35
veland A7 .....5.00
ver.O. G6 .....5.00
storia,O. S1 .....5.00
komo,Ind. C16 .....5.00
ssillon,O. R8 .....5.00
nessen,Pa. P7 .....5.00
wtucket,R.I.(11) N8..5.55
wtucket,R.I.(12) N8..5.50
nton,N.J. R5 .....5.30
rcester,Mass. A7 ....5.30
rcester,Mass. T6 ....5.30

RE, Fine and Weaving 8-in. Coils)

rtonville,Ill.(19) K4 ..7.70
cago W13 .....7.70

PE WIRE	Mild Plow	Plow	Imp. Plow
rtonville,Ill. K4	7.10	7.40	7.80
veland A7	7.50	7.80	8.20
nora,Pa. A7	7.50	7.80	8.20
storia,O. S1	7.50	7.80	8.20
nstown,Pa. B2	7.50	7.80	8.20
nessen,Pa. P7	7.50	7.80	8.20
wHaven,Conn. A7	7.80	8.10	8.50
rtsmouth,O. P12	7.50	7.80	8.20
rrowsPoint,Md. B2	7.60	7.90	8.30
uthers,O. Y1	7.50	7.80	8.20
nton,N.J. A7	7.80	8.10	8.50
nton,N.J. R5	7.50	7.80	8.20
ukegan,Ill. A7	7.50	7.80	8.20
liamsport,Pa. B2	7.60	7.90	8.30
rcester,Mass. J4	7.50	7.80	8.20

Cleveland A7 .....7.70
Fostoria,O. S1 .....7.70
Johnstown,Pa. B2 .....7.70
Kokomo,Ind. C16 .....7.70
Portsmouth,O. P12 ....7.70
Struthers,O. Y1 .....7.70
Trenton,N.J. R5 .....8.00
Waukegan,Ill. A7 .....7.70
Worcester,Mass. A7, T6.8.00

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2 ..4.15
Aliquippa,Pa. J5 .....4.15
Alton,Ill.(1) L1 .....4.15
Bartonville,Ill.(1) K4 ..4.15
Buffalo W12 .....4.15
Chicago W13 .....4.15
Cleveland A7, C20 .....4.15
Crawfrdsvll,Ind. M8 ...4.30
Donora,Pa. A7 .....4.15
Duluth A7 .....4.15
Fairfield,Ala. T2 .....4.15
Fostoria,O.(24) S1 ....4.50
Houston S5 .....4.55
Johnstown,Pa. B2 .....4.15
Joliet,Ill. A7 .....4.15
KansasCity,Mo. S5 .....4.75
Kokomo,Ind. C16 .....4.25
LosAngeles B3 .....5.10
Millbury,Mass.(12) N6..4.45
Minnequa,Colo. C10 ....4.50
Monessen,Pa. P7 .....4.15
Newark,6-8ga. I-1 .....4.75
No.Tonawanda B11 ....4.18
Palmer,Mass. W12 .....4.45
Pittsburg,Calif. C11 ....5.10
Portsmouth,O. P12 ....4.15
Rankin,Pa. A7 .....4.15
So.Chicago,Ill. R2 .....4.15
So.SanFrancisco C10 ....5.10
SparrowsPoint,Md. B2 ..4.25
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 .....5.10
Waukegan,Ill. A7 .....4.15
Worcester,Mass. A7,T6..4.45

WIRE (16 gage)	An'ld. Stone	Galv. Stone
Aliquippa J5	9.05	10.55
Bartnvill(19) K4.	9.05	10.55
Cleveland A7 ...	9.05	10.55
Fostoria,O. S1 ..	9.15	10.65
Johnstown B2 ...	9.05	10.55
Kokomo C16	9.05	10.10
Minnequa C10 ...	9.40	10.90
Pitts,Cal. C11 ..	9.40	10.90
Prtsmth.(18) P12	9.05	10.55
SparrowsPt., B2 .	9.15	10.65
Struthers Y1	9.05	10.55
Waukegan A7 ..	9.05	10.55

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala.City. R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	4.95	5.40
Bartnville.(19) K4	4.80	5.25
Cleveland A7 ...	4.80	5.25
Crawfrdvll. M8 .	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5.	5.20	5.65
Johnstown B2 ...	4.80	5.25
Joliet,Ill. A7 ...	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3 ..	5.75	...
Minnequa C10 ..	5.15	5.60
Monessen P7	4.80	5.25
Pitts.Cal. C11 ...	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2 ...	4.80	5.25
So.S.Fran. C10 ..	5.75	6.20
SparrowsPt. B2 .	4.90	5.35
Sterling,Ill.(1) N15	4.80	5.25
Struthers,O. Y1 .	4.80	5.25
Torrance,Cal. C11	5.75	...
Worcester A7 ...	5.10	5.55

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....5.20
Alton,Ill.(1) L1 .....5.20
Cleveland A7 .....5.20
Donora,Pa. A7 .....5.20
Duluth A7 .....5.20
Johnstown,Pa. B2 .....5.20
LosAngeles B3 .....6.15
NewHaven,Conn. A7 ...5.50
Pittsburg,Calif. C11 ...6.15
Portsmouth,O. P12 .....5.20
So.Chicago,Ill. R2 .....5.20
SparrowsPoint,Md. B2 ..5.30
Struthers,O. Y1 .....5.20
Torrance,Calif. C11 ....6.15
Trenton,N.J. A7 .....5.50
Waukegan,Ill. A7 .....5.20
Worcester,Mass. A7 ....5.50

WIRE, Barbed	Col.
AlabamaCity,Ala. R2 ...123	
Aliquippa,Pa. J5 123	
Atlanta A11 125	
Bartonville,Ill.(19) K4 ..123	
Crawfordsville M8 126	
Donora,Pa. A7 123	
Duluth,Minn. A7 123	
Fairfield,Ala. T2 123	
Houston,Tex. S5 131	
Johnstown,Pa. B2 123	
Joliet,Ill. A7 123	
KansasCity,Mo. S5 135	
Kokomo,Ind. C16 125	
Minnequa,Colo. C10 130	
Monessen,Pa. P7 123	
Pittsburgh,Calif. C11 143	
Portsmouth,O.(18) P12..123	
Rankin,Pa. A7 123	
So.Chicago,Ill. R2 123	
So.SanFran.,Calif. C10...143	
SparrowsPoint,Md. B2 ..125	
Sterling,Ill(1) N15 123	

FENCE POSTS — **Col.**

Duluth A7 112
Huntington,W.Va. W7 ..112
Johnstown,Pa. B2 112
Joliet,Ill. A7 112
Minnequa,Colo. C10 120
Moline,Ill. R2 116
Williamspt,Pa., S19..n.t.$120

WOVEN FENCE, 9-15½ gage — **Col.**

Ala.City,Ala.,17-18ga. R2.175
AlabamaCity,Ala. R2....109
Aliquip.,Pa.9-14½ga. J5..109
Atlanta A11 111
Bartonville,Ill.(19) K4 ..109
Crawfordsvll,Ind. M8 ...112
Donora,Pa. A7 109
Duluth A7 109
Houston,Tex. S5 117
Fairfield,Ala. T2 109
Johnstown,Pa. B2 109
Johnstn,17ga.,6" B2 183
Johnstn,17ga.,4" B2 186
Joliet,Ill. A7 109
KansasCity,Mo. S5 121
Kokomo,Ind. C16 111
Minnequa,Colo. C10 116
Monessen,Pa. P7 109
Pittsburg,Calif. C11 132
Portsmouth,O.(18) P12..109
Rankin,Pa. A7 109
So.Chicago,Ill. R2 109
Sterling,Ill.(1) N15 109

BALE TIES, Single Loop — **Col.**

AlabamaCity, Ala. R2 ...106
Atlanta A11 107
Bartonville,Ill.(19) K4 ..106
Chicago W13 106
Crawfordsville M8 109
Donora,Pa. A7 106
Duluth A7 106
Fairfield,Ala. T2 106
Joliet,Ill. A7 106
Kokomo,Ind. C16 108
Minnequa, Colo. C10 ...113
Pittsburg,Calif. C11 130
Portsmouth,O.(18) P12 .106
So.Chicago,Ill. R2 106
So.SanFran.,Calif. C10 ...130
SparrowsPoint,Md. B2 ...108
Sterling,Ill.(1) N15 106

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2 ..5.20
Bartonville,Ill.(19) K4 ..5.20
Donora,Pa. A7 .....5.20
Duluth A7 .....5.20
Johnstown,Pa. B2 .....5.20
Joliet,Ill. A7 .....5.20
Kokomo,Ind. C16 .....5.30
Minnequa, Colo. C10 ....5.55
Pittsburg,Calif. C11 ....6.15
Portsmouth,O. P12 ....5.20
Rankin,Pa. A7 .....5.20
So.Chicago,Ill. R2 ....5.20
SparrowsPoint,Md. B2...5.30
Worcester,Mass. A7 ....5.50

NAILS & STAPLES, Stock (To Consumers)

AlabamaCity,Ala. R2 ...103
Aliquippa,Pa. J5 103
Atlanta A11 105
Bartonville,Ill.(19) K4 ..103
Cleveland A9 110
Crawfordsville M8 106
Donora,Pa. A7 103
Duluth A7 103
Fairfield,Ala. T2 103
Houston,Tex. S5 111
Johnstown,Pa. B2 103
Joliet,Ill, A7 103
KansasCity,Mo. S5 115
Kokomo,Ind. C16 105
Minnequa, Colo. C10 110
Monessen,Pa. P7 103
Pittsburg,Calif. C11 122
Portsmouth,O. P12 103
Rankin,Pa. A7 103
So.Chicago,Ill. R2 103
SparrowsPoint,Md. B2 ..105
Sterling,Ill.(1) N15 103
Torrance,Calif. C11 123
Worcester,Mass. A7 109

NAILS & STAPLES, Stock (To Jobbers) — **Col.**

Chicago,Ill. W13 103
Minnequa,Colo. C10 107
Portsmouth,O. P12 100

NAILS, Cut (100 lb keg)

Conshohoken,Pa. A3 ..$6.75
Wheeling,W.Va. W10 ...6.75

AXLES

Fairfield,Ala. T2 .....5.20
Gary,Ind. C3 .....5.20
Ind.Harbor,Ind. S13 ....5.20
Johnstown,Pa. B2 .....5.20
McKeesRocks,Pa. C3 ...5.20

TIE PLATES

Fairfield,Ala. T2 .....4.05
Gary,Ind. C3 .....4.05
Ind.Harbor,Ind. I-2 ....4.05
Lackawanna,N.Y. B2 ...4.05
Minnequa,Colo. C10 ...4.05
Pittsburg,Calif. C11 ...4.20
Pittsburgh R2 .....4.05
Seattle B3 .....4.50
Steelton,Pa. B2 .....4.05
Torrance,Calif. C11 ....4.20
Weirton,W.Va. W6 .....4.05

JOINT BARS

Bessemer,Pa. C3 .....4.25
Fairfield,Ala. T2 .....4.25
Ind.Harbor,Ind. I-2 .....4.25
Joliet,Ill. C3 .....4.25
Lackawanna,N. Y. B2...4.25
Minnequa,Colo. C10.....4.25
Steelton,Pa. B2 .....4.25

TRACK BOLTS — (20) **Treated**

Fairfield,Ala. T2 .....8.50
Lebanon,Pa. B2 .....8.50
Minnequa,Colo. C10 ....8.25
Pittsburgh,Pa. O3, P14 .8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2 .....5.35
Ind.Harbor,Ind. I-2, Y1 .5.35
Lebanon,Pa. B2 .....5.35
Minnequa, Colo. C10 ...5.35
Pittsburgh J5 .....5.35
So.Chicago,Ill. R2 .....5.35
Struthers,O. Y1 .....5.35
Youngstown R2 .....5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7 ..3.55
Williamsport,Pa. S19 ...3.55

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb. Under
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I-2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...(16)	3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa,Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

Key to Producing Companies

Lukens Steel Co.

McLouth Steel Corp.
Mahoning Valley Steel
Medart Co.
Mercer Tube & Mfg. Co.
Mid-States Steel & Wire
Midvale Co.
Missouri-Illinois Furnace
Moltrup Steel Products
Monarch Steel Co.

National Supply Co.
National Tube Co.
Nelsen Steel & Wire Co.
New Eng.High Carb.Wire
Newman-Crosby Steel
Niles Rolling Mill Co.
Nrthwst. Steel Roll. Mills
Northwestern S.&W. Co.
New Delphos Mfg. Co.

Oliver Iron & Steel Corp.
Oregon Steel Mills

Pacific States Steel Corp.
Pilgrim Drawn Steel Crp.
Pittsburgh Coke & Chem.
Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.

T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San. Corp.

U4 Universal Cyclops Steel

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn. Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Hi.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	69.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(7) Deformed.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.00c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage point lower on ⅛", 2 points lower on ¼", 3 points lower ⅜", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

Columns B & E: Sparrows Point, Md. B2; Wheatland, Pa., ⅛ through ⅜", W9.

Columns C & F: Alton, Ill. (Lorain, O. Base) LI; Indiana Harbor, Ind., ½ through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛ through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛ through ⅜" W9. Following make ½ through 3" only; Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 4 to 24 in., inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	—Seamless— C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

BOLTS, NUTS

(To consumers)

F.o.b. midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in. long 35
⅝ & ⅝ x 6 in., shorter. 37
¾-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

Semifinished hexagon	A.S. Reg. & Light	Heavy
⅞-in., smaller.	41 off	.....
½-in., smaller.	.....	38 off
½-in.-1-in.	....39 off	.....
⅝-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	.37 off	35 off
1⅝-in., larger.	.34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller .51 off
¾, ⅞, & 1 x 6-in. & shorter ..... .35 off
Headless, ¼-in., larger .31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 6.75c
⅞-in., under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	37.50	30.50	28.50
302	37.50	33.00	28.50
303	39.50	36.50	31.00
304	39.50	35.00	30.00
309	52.00	52.00	41.50
316	53.00	55.00	46.00
321	45.50	44.50	34.00
347	50.00	48.50	38.50
410	33.00	27.00	23.00
416	33.50	33.50	23.50
420	40.50	43.50	28.50
430	35.50	27.50	23.50
501	24.00	22.50	11.50
502	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets except 309 E2
Baltimore, bars, wire and structurals A10
Brackenridge, Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4
Butler, Pa., sheets except Types 501 & 502 A10
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18
Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7
Detroit, strip, except Type 309 quoted 51.00c M1
Dunkirk, N.Y., bars, wire A4
Duquesne, Pa., bars C3
Gary, Ind., sheets except Type 416 C3
Harrison, N. J., strip C18
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501 10.50c, Type 502 11.50c R2
McKeesport, Pa., bars; sheets except Type 416, C3
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2
Middletown, O., sheets and strip, except Types 501 and 502 and except 309 strip quoted 51.00c A10
Midland, sheets & strip C18
Munhall, Pa., bars C3
Pittsburgh, sheets C18
Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4
So. Chicago, Ind., bars & structurals C3
Syracuse, N. Y., bars, wire & structurals C18
Titusville, Pa., bars U4
Wallingford, Conn., strip W2
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309: 316 sheets 58.00c strip 60.00c W4
Watervliet, N. Y., structurals & bars A4
Waukegan, bars & wire A7
West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4
Youngstown, strip C8.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
CARBON		
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25
8	60	8.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

REFRACTORIES

(Prices per 1000 brick, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hardfired, $135 at above points.
High-heat Duty: Salina, Pa. $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Oriviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.
Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Oriviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.
Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W.Va.; Irondale, Wellsville, O.
Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)
Burned chrome brick, $66; Chemical - bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)
Domestic dead - burned, ⅜" grains; Bulk, $30.50-$31.00; single paper bags, $35.00-$35.50.

DOLOMITE

(Base prices per net ton)
Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersvile, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg. .19.00-23.50
Industrial xylol ..20.50-26.50
Per ton bulk, ovens
Sulphate of ammonia $45.00
Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots..14.00
Do., tank cars 12.50

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.
Old range bessemer ...$7.60
Old range nonbessemer..7.45
Mesabi bessemer 7.35
Mesabi nonbessemer ...7.20
High phosphorus 7.20

EASTERN LOCAL ORE

Cents, unit, del. E. Pa. Foundry and basic 56.62% concentrates, contract .16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports
Swedish basic, 60 to 68%:
Spot: 17.00
Long-term contract..15.00
Brazil iron ore, 68-69% .19.50

TUNGSTEN ORE

Wolframite scheelite, net ton unit, duty pd. $26-$28

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. U.S. ports; prices on lower grades adjusted to Mn content and impurities.

CHROME ORE

Gross ton f.o.b. cars, new York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.
Indian and African
48% 2.8:1 .....37.50
48% 3:1 .....39.00
48% no ratio 31.00
South African Transvaal
44% no ratio ...$25.50-26.00
45% no ratio 26.50
48% no ratio 29.00-30.00
50% no ratio 29.50-30.50
Brazilian—nominal
44% 2.5:1 lump $33.65
Rhodesian
45% no ratio $27-27.50
48% no ratio 30.00
48% 3:1 lump 39.00
Domestic—rail nearest seller
48% 3:1 .....$39.00

MOLYBDENUM

Sulphide conc., lb, Mo, cont. Mines $0.90

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur. $13.00-13.50
Connellsvll, fdry. 15.50-16.00
New River, foundry ...18.00
Wise county, foundry..15.35
Wise county, furnace..14.60

OVEN FOUNDRY COKE

Kearny, N. J., ovens..$22.00
Everett, Mass., ovens ....
New England, del.‡..22.70
Chicago, ovens 20.00
Chicago, del. .....†21.45
Detroit, del. 23.91
Terre Haute, ovens....20.20
Milwaukee, ovens 20.75
Indianapolis, ovens 19.85
Chicago, del. 23.32
Cincinnati, del. 22.77
Detroit, del. 23.75
Ironton, O., ovens 19.40
Cincinnati, del. 21.63
Painesville, O., ovens..20.90
Buffalo, del. 23.02
Cleveland, del. 22.62
Erie, del. 21.04
Birmingham, ovens 17.70
Philadelphia, ovens 20.45
Swedeland, Pa., ovens..20.40
Portsmouth, O., ovens..19.50
Detroit, ovens 20.65
Detroit, del. *21.70
Buffalo, del. 22.95
Flint, del. 23.00
Pontiac, del. 21.98
Saginaw, del. 23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡Or within $4.03 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.90	6.49	6.88	5.65	...	5.65	6.21	8.10	5.35	5.60	6.80
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.27‡	5.94**	6.83	5.39	6.10	5.44	5.95	...	5.44	5.64	7.05
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[5]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[5]	5.23	5.43	6.88
Milwau. (c'try).	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[5]	5.08	5.28	6.73
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
L. A. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco..	6.15[10]	7.50[3]	7.80	6.75[10]	8.25[3]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.10	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add O.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

(*Please turn to page* 252)

Lead and Zinc Prices Decline

Heavy offerings of foreign lead force domestic price to 14.05c, St. Louis. Zinc drops to 9.25c, East St. Louis, as steel strike halts galvanizing operations

New York—Lead and zinc have moved to lower price levels, while undertone of other primary markets are somewhat weaker. Buying has diminished as many large consumers await developments on the domestic labor front.

The ½-cent decline in lead to the basis of 14.05c, St. Louis, is attributed to the offerings of large tonnages of foreign lead at about equivalent of the new domestic price. The ¾-cent decline in zinc is due directly to the steel strike which has brought galvanizing operations to a virtual standstill. Weakness in other markets stems indirectly from the strikes in several basic industries since they likely will have an adverse effect on the country's economy if prolonged.

Lead—The decline in lead was initiated by a leading custom smelter on Oct. 3 and the new price was adopted by mine producers the following day. Lower price followed increased offerings of foreign lead to domestic users at 13.75c a pound, New York, including the import duty. This price is equivalent to about 14.00c to 14.25c, delivered to the consumer's plant in this country, depending upon the distance from New York.

Despite the decline in lead, buying has fallen off sharply. Pressure of foreign lead for sale in the United States market is still being exerted. Some consumers believe that the 13.75-cent price might be shaded and, if this occurs, might force the domestic market to still lower levels. Demand had been sufficient before the devaluation of Britain's currency to take care of day-to-day supply from regular suppliers of foreign lead to the United States. It is not sufficient to absorb the larger supply of foreign metal offered here at price concessions.

While demand for refined lead has dropped sharply, offerings of scrap lead have increased and custom smelters and other refiners of scrap materials have boosted their charges for smelting storage battery plates to $90 a ton. This is equivalent to a discount of 6.40 cents a pound for the lead content. A week previously the smelting charge had been $80 a ton, or a discount of 5.70 cents a pound for the lead content. Present price trend for scrap lead compares with the nearer normal figure of $40 a ton, or 2.80c a pound discount that had been charged several weeks ago.

Zinc—The price cut in zinc was the first change since the quotation had recovered from the low of 9.00c to 10.00c in July. The zinc price had fallen 8.50 cents a pound during the spring from its high of 17.50c.

One of the leading manufacturers of die casting alloy reduced its price ¾-cent a pound to the basis of 13.00c, delivered in carlots, effective Oct. 4.

Copper—Demand for copper has held up in better fashion than either lead or zinc, although it is slightly lighter than it was prior to the steel strike.

It is estimated that total September deliveries exceeded 100,000 tons, including a 10,000-ton carryover from August. In addition to these deliveries, substantial tonnages were sold to the government for the national stockpile.

According to the Department of Commerce, production in Chile of copper in bars totaled 201,909 tons in the first six months of this year, or only 4 per cent below production recorded in the like period a year ago.

Tin—Although RFC's selling price on Grade A tin for spot delivery held at 96.00c, a small tonnage sold on the outside market at 95.87½c. Prices quoted on Grade A for October arrival range from 95.75c to 95.00c, depending upon the prospective date of delivery. For deliveries during November and later months the prices stand at 95.00c for Grade A and 94.50c for Grade B tin.

STEEL's Metal Price Averages for Sept., 1949

(Cents per pound)

Electrolytic Copper, del. Conn.	17.625
Lead, St. Louis	14.853
Prime, Western Zinc, E. St. Louis	10.058
Straits Tin, New York	101.654
Primary Aluminum Ingots, del.	17.000
Antimony, f.o.b. Laredo, Tex.	38.500
Nickel, f.o.b. refinery	40.000
Silver, New York	73.202

Prices quoted on No. 1 Chinese tin range from 89.00c for prompt delivery down to 82.00c for October shipment from Hong Kong, depending on quality of the various brands.

Buyers here are buying only occasional tonnages and are not expected to enter the market actively until the steel strike is settled. It is estimated that current consumption is only 1750 tons a month compared with about 4000 tons a month at this time a year ago.

World production of tin-in-concentrates declined sharply to 12,900, long tons in July after the postwar record of 15,600 in June, the statistical bulletin of the International Tin Study Group reports.

This was due to the drop in Bolivian exports from 4001 in June to 2348 tons in July. Malayan production decreased to 4593 tons against 4802 tons in the previous month.

World production of tin metal at 14,000 tons in July was the same as in the previous month.

World production of tin metal in July is estimated at 9700 tons, the same as in May, and 300 tons less than in June.

Aluminum Plant Reopens

Richmond, Va.—Reynolds Metals Co. will reopen immediately its aluminum plant at Jones Mills, Ark., because of a sharp upturn in the company's business in that metal, Richard S. Reynolds Jr., announces. The company's Hurricane Creek plant and mines in Arkansas were reopened following a seven-week strike which started on Aug. 1. Reopening of the Jones Mills plant was delayed until justified by an increase in demand for aluminum. Before suspension, the latter plant had been producing aluminum at the annual rate of 36,000 tons.

Domestic output of primary aluminum in May established a postwar record of 56,909 tons. This represents a gain of 5 per cent over the April total of 54,076 tons and establishes the highest average daily rate of production since August, 1944. Output in the first five months of the year increased at a faster rate than demand, stocks at reduction plants having more than doubled during May to a total of 12,888 tons, the largest inventory recorded since October, 1947.

Output of aluminum ingot at secondary smelters declined 11 per cent to 8409 tons in April, reports Bureau of Mines. A corresponding decline in aluminum-base scrap consumption established a new low operating level for the industry in April. Practically all of the decline in scrap consumption resulted from decreased use of obsolete scrap as the total consumption of plant scrap remained virtually unchanged.

Imports of aluminum-base scrap decreased 37 per cent in April. Receipts from United Kingdom, Belgium and Luxembourg, Poland and Danzig, and Czechoslovakia were reduced the most, while those from Germany and Austria were larger.

Brown Foundry Corp. Formed

Philadelphia — Brown Foundry Corp., 22nd street and Washington avenue, this city, has been organized to own and operate the foundry and foundry equipment of the Phosphor Bronze Corp., this city. As stated in Sept. 26 issue of STEEL, the plant's line of nonferrous castings and products will be expanded to include aluminum castings. The plant's present capacity is 20,000 pounds a week on a single shift basis. William G. Brown, works manager, will be chief operating executive.

Leases Laterite Deposits

St. Helens, Oreg.—Columbia County court, this city, has signed a 50-year lease with Alcoa Mining Co. granting mineral rights on nine parcels totaling 100 acres for all metals associated with laterite, but retaining other mineral rights. The eight-mile area is said to contain the largest laterite deposits in the Pacific Northwest.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 15.50-16.50c; 88-10-2 (No. 215) 24.50c; 80-10-10 (No. 305) 21.00c; No. 1 yellow (No. 405) 13.25-14.25c.

Zinc: Prime western 9.25c, brass special 9.50c, intermediate 9.75c, East St. Louis; high grade 10.25c, delivered.

Lead: Common 14.05c; chemical 14.15c; corroding 14.15c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.00-16.50c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.25c; grade 2, 16.25c; grade 3, 15.25c; grade 4, 14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) 96.00c; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, 95.80c; grade C, 99.65-99.79%, incl., 95.40c; 99.5-99.649% 95.40c; grade F, 98-98.999% 94.50c for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $73-$75 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.693, l.c.l. 25.443, c.l. 24.943; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $19.25 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $19.25 per cwt. Traps and bends: List price plus 50%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75; No. 2 copper 12.75; light copper 11.75; composition red brass 10.75, radiators 8.75; heavy yellow brass 8.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75; No. 2 copper 12.75; light copper 11.75; refinery brass (60% copper) per dry copper content nom.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.00-12.25; No. 2 11.00-11.25; light copper 10.00-10.25, No. 1 composition red brass 9.00-9.25, No. 1 composition turnings 8.50-8.75, mixed brass turnings 5.50-5.75; new brass clippings 10.00-10.50, No. 1 brass rod turnings 7.75-8.00; light brass 5.50-5.75; heavy yellow brass 6.00-6.25; new brass rod ends 7.75-8.00; auto radiators, unsweated 7.50-7.75; cocks and faucets, 7.25-7.50; brass pipe 8.00-8.25.

Lead: Heavy 10.00-10.50, battery plates 4.00-4.50, linotype and stereotype 11.00-11.25, electrotype 9.75-10.00, mixed babbitt 10.75-11.00.

Zinc: Old zinc 3.50-4.00, new die cast scrap 3.25-3.75, old die cast scrap 2.50.

Tin: No. 1 pewter 48.00-50.00, block tin pipe 70.00-72.00, No. 1 babbitt 36.00-38.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 7.00-7.50, crankcase 7.00-7.50, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 4-6	17.625	14.05	9.25	96.00	17.00	38.50	40.00	73.25
Oct. 3	17.625	14.10	9.25	96.00	17.00	38.50	40.00	73.25
Oct. 1	17.625	14.55	10.00	96.00	17.00	38.50	40.00	73.25
Sept. Avg.	17.625	14.353	10.058	101.654	17.000	38.500	40.000	73.202
Aug. Avg.	17.625	14.806	10.000	103.00	17.000	38.500	40.000	71.889
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

STEELMAKING SCRAP COMPOSITE

Oct. 6	$27.25
Sept. 29	27.58
Sept. 1949	26.07
Oct. 1948	43.25
Oct. 1944	16.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$29 50-30.00
No. 2 Heavy Melt.	27.50-28.00
No. 1 Busheling	29.50-30.00
No. 1 Bundles	29.50-30.00
No. 2 Bundles	22.50-23.00*
No. 3 Bundles	21.50-22.00*
Heavy Turnings	22.00-23.00*
Machine Shop Turnings	20.00†
Mixed Borings, Turnings	20.00†
Short Shovel Turnings	22.00*
Cast Iron Borings	21.00*
Low Phos. Steel	31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast	39.00-40.00
Charging Box Cast	31.00-32.00*
Heavy Breakable Cast	28.00-29.00*

Railroad Scrap**

No. 1 R.R. Heavy Melt.	32.00-32.50
Axles	36.00-37.00
Rails, Random Length	35.00-36.00
Rails, 2 ft and under	39 00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	33 00-34.00

* Nominal.
** Brokers' purchase prices.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$26.50†
No. 2 Heavy Melt. Steel	25.50†
No. 1 Busheling	26.50†
No. 1 Bundles	26.50†
No. 2 Bundles	23.50†
Machine Shop Turnings	17.00†
Mixed Borings, Turnings	19.00†
Short Shovel Turnings	19.00†
Cast Iron Borings	19.00†
Bar Crops and Plate	27.50†
Punchings & Plate Scrap	27.50†
Cut Structurals	29.50†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Stove Plate	35.00-36.00
Heavy Breakable Cast	32.00-33.00
Unstripped Motor Blocks	30.50-31.50
Malleable	34.00-35.00
Brake Shoes	31.00-32.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	35.00-36.00
Burnt Cast	32.00-33.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	34.00-35.00
Rail, 3 ft and under	38.00-39.00
Rails, Random Lengths	32.00-33.00
Cast Steel	27.00-28.00
Railroad Specialties	31.00-32.00
Uncut Tires	30.50-31.00
Angles, Splice Bars	34.00-35.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	30.00-30.50
No. 1 Bundles	31.00-31.50
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings	22.00-23.00
Cast Iron Borings	22 00-23.00
Low Phos.	32 00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32 00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	23.50
No. 1 Busheling	23.50
No. 1 Bundles	25.00
No. 2 Bundles	22.50
Machine Shop Turnings	17.00
Short Shovel Turnings	18.00
Mixed Borings, Turnings	16.00
Bar Crop and Plate	27.00
Punchings & Plate Scrap	27.00
Cut Structurals	26.00
Elec. Furnace Bundles	25.00-25.50
Heavy Turnings	25.00
No. 1 Chemical Borings	26.00

Cast Iron Grades

No. 1 Cupola Cast	35.00
No. 1 Machinery Cast	37.00
Charging Box Cast	33.00-34.00
Heavy Breakable Cast	33.00-34.00
Unstripped Motor Blocks	29.00-30.00
Clean Auto Cast	37.00
No. 1 Wheels	36.00-37.00
Malleable	36.00-37.00*

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	26.00
No. 1 Bundles	26.00
No. 2 Bundles	20.00
Machine Shop Turnings	12.00
Short Shovel Turnings	15.00
Mixed Borings, Turnings	15.00
Cast Iron Borings	15.00

Cast Iron Grades

No. 1 Cupola Cast	41.00
Charging Box Cast	31.00
Heavy Breakable Cast	34.00
Stove Plate	30.00
Unstripped Motor Blocks	20.00
Brake Shoes	22.00
Clean Auto Cast	38.50
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00
R.R. Malleable	33.00
Rails, Rerolling	37.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	44.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$17.00-18.00
No. 1 Bundles	20.00-21.00
No. 2 Bundles	17.00-18.00
No. 1 Busheling	20.00-21.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings	14.00-15.00
Cast Iron Borings	14.00-15.00
Punchings & Plate Scrap	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast	28.00-29.00
Clean Auto Cast	32.00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	$28.00-28.50
No. 2 Heavy Melt. Steel	25.50-26.00
No. 1 Bushelings	25.50-26.00
No. 1 Bundles	27.50-28.00
No. 2 Bundles	24.00-24.50
Machine Shop Turnings	19 00-19.50
Mixed Borings, Turnings	20.00-20.50
Cast Iron Borings	20.00-20.50
Short Shovelings	21.50-22.00
Low Phos.	29.50-30.00

Cast Iron Grades

No. 1 Cupola	38.00-38.50
No. 1 Machinery	39.00-39.50
Mixed Yard	36.50-37.00
Malleable	35.50-36.00

Railroad Scrap

Rails, 3 ft. and under.	36 00-37.00
Scrap rails	31.00-32.00
Specialties	32.00-33.00
No. 1 car wheels	33.00-34.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18 00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	10.00-11.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings.	11.00-12.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles.	21.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
No. 1 Machinery	32.00
Charging Box Cast	25.00-26.00
Heavy Breakable	25.00-26.00
Unstripped Motor Blocks	26.00
Malleable	27.00-28.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$17.50-18.00
No. 2 Heavy Melt. Steel	16.00-17.00
No. 1 Bundles	17.00-18.00
No. 1 Busheling	14.00-15.00
Machine Shop Turnings	12.50-13.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings.	14.00-15.00
Bar Crops and Plate	19.00-20.00
Punchings & Plate Scrap	19.00-20.00
Chemical Borings	17.00-18.00

Cast Iron Grade

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast.	18.00-20.00
Stove Plate	22.00-23.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	$26.00-28.00
No. 2 Heavy Melt. Steel	22.00-23.00
No. 1 Bundles	26.00-28.00
No. 2 Bundles	22.00-23.00
No. 3 Bundles	17.00-18.00
Machine Shop Turnings	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings.	19.00-20.00
Cast Iron Borings	16.00-17.00
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles.	25.00-26.00
Heavy Turnings	23.00-24.00
Cut Structurals	27.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	33.00-34.00
Stove Plate	29.00-30.00

Railroad Scrap†

No. 1 R.R. Heavy Melt.	31.00-32.00
Malleable	34.50-35.50
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	34.50-35.50
Rails, 2 ft. and under	38.00-39.00
Rails, 18 in. and under	39.00-40.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	35.50-36.50

† Nominal.

ST. LOUIS

No. 1 Heavy Melt. Steel	$27.00-28.00
No. 2 Heavy Melt. Steel	24.00-25.00
Machine Shop Turnings	18.00-19.00
Short Shovel Turnings.	18.00-19.00

Cast Iron Grades

No. 1 Cupola Cast	36 00-38.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast.	32.00-33.00
Brake Shoes	30.00-31.00
Clean Auto Cast	40.00-42.00
Burnt Cast	30.00-31.00

Railroad Scrap

R.R. Malleable	31.00-32.00
Rails, Rerolling	36 00-38.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under.	36.00-38.00
Uncut Tires	26.00-27.00
Angles, Splice Bars	32.00-33.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.50
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	30.00
Rails 3 ft. and under.	25.00-26.00
Angles and Splice Bars	31.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Bushelings	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structural	22.00
Elec. Furnace Bundles.	23.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-27.50
Heavy Breakable Cast.	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	17.00-18.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Railroad Malleable	22.00
Rails, Random Lengths	17.00
Angles and Splice Bars	17.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	$30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$20.00
No. 1 Bundles	20.00
Mechanical Bundles	18.00
Mixed Steel Scrap	16.00
Mixed Borings, Turnings	14.00
Rails, Remelting	20.00
Rails, Rerolling	23.00
Busheling	14.00
Bushelings new factory, prep'd	18.00
Bushelings new factory, unprep'd	13.00
Short Steel Turnings	14.00

Cast Iron Grades*

Cast	33.00-35.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

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Sheets, Strip . . .

Sheet, Strip Prices, Pages 231, 232 & 233

Boston—One of the first flat-rolled steel consuming groups sensitive to any extended suspension in supply will be builders of household fuel tanks. These tanks are fabricated principally of No. 12 gage hot-rolled sheets, inventories of which are low. Other users of carbon, silicon and enameling sheets and carbon strip are better fixed, some having inventories for about 45 days at current consumption.

While there are exceptions, shipments were substantial late last quarter. In the case of tack plate, stocks are heavy and sufficient for several months, the same being true to less degree on shank steel strip.

Demand for carbon sheets has held to levels preventing any substantial accumulation of semifinished material at finishing mills. The factor should be considered once rolling is resumed.

Bethlehem Steel Co. is low on 1200 tons 24-gage deep drawing cold-rolled sheets for Massachusetts automobile plates, quoting 4.85c, Sparrows Point, Md., or 5.47c, delivered Charlestown, Boston. Two mills and two distributors quoted on this tonnage. First 100 tons is wanted by Nov. 10 with 100 tons monthly until complete.

New York—Sheet producers who are able to continue operations are being deluged with inquiry. Those who have not been booked extensively on hot sheets and certain other grades should have little difficulty in filling up schedules for the fourth quarter and even for some weeks beyond if they care to. Disposition of some of those not strikebound is to accept nothing for delivery beyond end of this year, preferring for the present to await developments.

Consumers of hot, cold galvanizing and enameling sheets are turning to jobbers for an increasing amount of tonnage. On an average most consumers have around 30 days' supply but are anxious to augment inventories where possible even at the expense of having to pay warehouse premiums on some of it.

Pittsburgh—Excluding output at Weirton and Butler, Pa., sheet and strip production schedules have been terminated in this district by the steel strike. The same situation prevails among nonintegrated cold-rolled strip interests some of which are not under contract with USA, but have closed because of lack of hot-rolled steel. Stainless sheet and strip output was fairly well sustained last week. Allegheny Ludlum and smaller independent companies are still operating. Allegheny Ludlum's labor contract expires Oct. 15. The galvanized grain-corn bin storage program will not be so adversely affected by industry wide strike as earlier feared. Weirton Steel may be called upon to help complete urgently needed tonnage commitments, while at least one concern performing the galvanizing function only expects to continue operations indefinitely.

Mill sales offices are urging customers to get on rolling schedules for delivery following termination of the strike. It is contended that the relatively prompt deliveries for most sheet and strip items prior to the

rike will be much further extended hen operations resume, particularly strike is of long duration. At least ne interest is seriously considering eturn to strict allocation basis on alvanized and cold-rolled sheets to acilitate production scheduling after ne strike.

Philadelphia — Apart from warehouse shipments, sheets are moving rincipally from such few plants as re still operating in the Pittsburgh nd midwestern districts. Despite onsuming pressure, mills still in peration are restricting sales to egular customers and are refusing o commit themselves on tonnage for hipment beyond this year.

Chicago—Closure of Acme Steel o. Wednesday night by strike shut ff the last important mill source of trip in the area. Negotiations failed fter contract expiration Oct. 1. Lo-al sheet consumers are fairly well upplied with hot-rolled material but xpectations are cold-rolled supplies ill give out rather quickly. No ma-or local consumer has received as uch of this product as it would like. trike is temporarily booming the usiness of secondary product sellers, lthough wanted gages are not in mple supply. Offerings are appear-ng rather frequently now from op-rators in the gray market.

Cleveland—Demand for secondary uality sheets, strip and plates was xceptionally heavy in the last six eeks before the strike as ware-ouses, brokers and consumers laid n stocks in anticipation of the work toppage.

Republic Steel Corp. disposed of ractically all of its secondary flat-olled material. This material accu-nulated after the easing in steel de-nand early in the year placed em-hasis on highest quality.

Armco Steel Corp., most of whose lants are not affected by the cur-ent steelworkers' strike, is being of-ered orders by consumers they or-inarily do not serve. Armco can't elp them much, because it already well booked up with orders from s regular customers.

Cincinnati — Operations of Armco teel Corp. are at capacity at plants n Middletown, Hamilton, and Zanes-ille, and in Butler, Pa.

St. Louis—Demand for sheets is ne highest in a year, filling mills' ooks through fourth quarter. Plants re so far unaffected by the strike, ost union units working under an xtension of old contracts.

Los Angeles — Question of the our is, "How long will inventories ast?" Although Kaiser Steel Co., ontana; Pacific States Steel Co., iles; and Southwest Steel Rolling ills, Los Angeles, are not affected y the general mill shutdown, the pen hearths and electric furnaces of hese producers obviously cannot eet all needs. Some finishing mills, uch as California Cold-Rolled Steel orp., are continuing production but heir operations are virtually limi-ed to present supplies of hot-rolled trip.

Tubular Goods . . .

Tubular Goods Prices, Page 234

New York—District distributors of erchant pipe, most of whom had been receiving tonnage on a monthly allotment basis, will quickly feel effects of the steel strike. They had been moving their tonnage just about as fast as it came in and, in some instances, had been adversely affected by failure of producers to maintain full shipments against allotments. One large pipe producer at time of strike was behind on shipments two to three weeks.

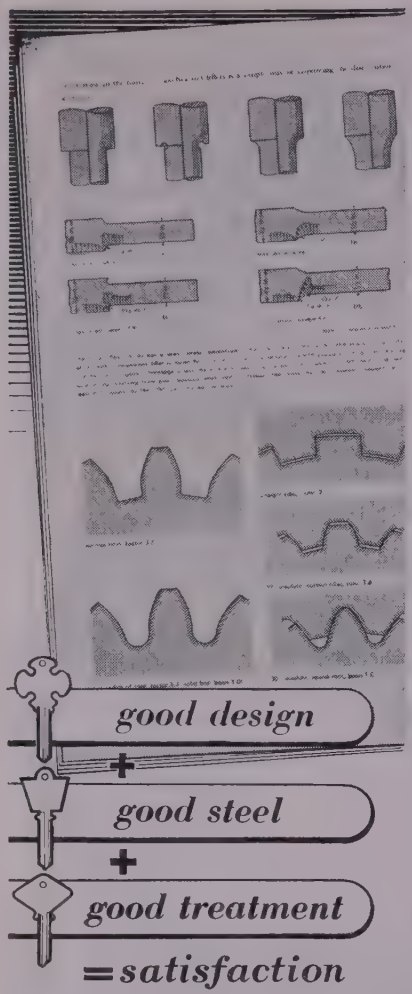
Boston—While merchant steel pipe inventories are fair, prestrike buying was not heavy, same applying to pressure and mechanical tubing. Withdrawal of consigned stocks in case of distributors tends to operate toward conservatism in buying with that class of sellers. Lap weld stocks are somewhat heavier than those of seamless, although earlier pressure for the latter has eased.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 231

Los Angeles — Reinforcing bars are in decidedly short supply, although Kaiser's continued production may meet at least minimum needs.

Seattle — Orders for reinforcing bars in lots of less than 100 tons are in good volume. Demand for merchant bars is slow. Heavy shipments were made prior to the strike shutdown by Bethlehem Pacific Coast Steel Corp.



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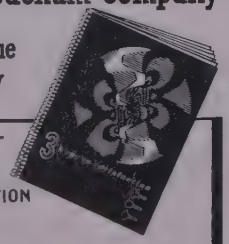

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Steel Bars . . .

Bar Prices, Page 231

Chicago—One development unforeseen by most observers before the strike began was a possible shortage of hot and cold-rolled carbon and alloy bars. To a limited extent, such a shortage has developed. Some automakers are left high and dry on shipments promised for delivery before the strike deadline from other steelmaking centers and are now seeking fast shipment on crucial sizes from a local source. Local independent cold-finishers are operating at about normal with very few cases of serious shortages yet reported by customers. Hot material is in fairly comfortable supply with some of the drawers, although not in a complete range of sizes. There seems to be no disposition by the CIO to foreclose on the open-end contract extension which some of these mills have in effect.

New York—Hot carbon bar inventories at district consuming plants average about 30 days' supply. This means that some shops are in a poor position. Some are known to have little more than two weeks' supply on hand, resulting in increased pressure on jobbers. Distributors are endeavoring to limit orders to reasonable amounts, so as to assist as many of their regular customers as possible and for as long a time as they can.

Cold drawers directly identified with large steel producing companies have been forced to withdraw from the market because of labor disruptions. Most independent cold drawers have not been forced to curtail, although they will have to restrict because of lack of hot bars if the strike is prolonged. Meanwhile, they are being confronted with a substantial pick-up in demand—an improvement that really set in two or three weeks ago as buyers became increasingly concerned over the steel labor outlook. Buying by jobbers, who for some months past have been virtually out of the market for cold drawn bars, is contributing substantially to this improvement.

Pittsburgh—Cold-finished bar output is sharply curtailed due to strikes at Jones & Laughlin, Wyckoff at Ambridge, and Moltrup at Beaver Falls, Pa. Contract termination for Columbia Steel & Shafting is Oct. 11. A number of other cold finishers are still operating in other districts, but the industry generally is strike-bound. Those operating have sufficient hot-rolled inventory to sustain production schedules at least two weeks; customers' stocks represent 30 to 40 days' supply. Standard specifications on both carbon and alloy cold-finished items are still available from stock.

Boston—Carbon bar inventories held by many consumers range from 45 days and beyond, cold finished stocks being notably substantial. Cold-drawn bar producers have large inventories and loss of hot-rolled tonnage will not be seriously felt for some time as cold finishing operations have been sharply reduced by converters in this district.

Philadelphia—Except for tonnage shipped by independent cold drawers and jobbers, movement of bars is at

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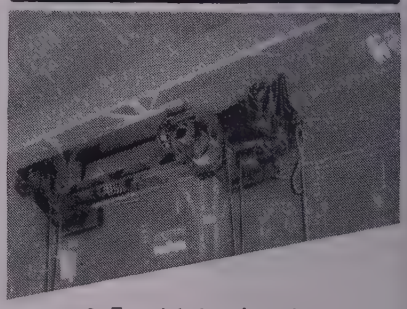

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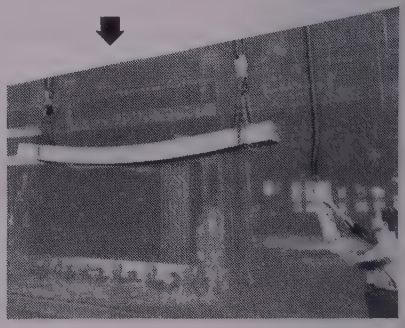

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virtual standstill. Consumers have n average of about one month's ıpply and, consequently, are main-ıining operations.

Los Angeles—Inventories of hot-ɔlled bars are larger than those of ny other steel product. Most fabri-ators have a 60-90 day supply, well ɔove normal. Demand for bars from ɔbbers has increased only slightly ith inception of the strike, but sea-ɔnal requirements normally would ıcrease this month from such con-ımers as farm implement manufac-ırers.

in Plate . . .

Tin Plate Prices, Page 232

Pittsburgh—Near term consumer n mill product supply outlook is ıvorable, despite complete shutdown production facilities here. Weirton teel is only interest producing tin ill products by reason of its con-act with an independent union. Re-eated strike threats offered ample ɔportunity for major can companies satisfactorily augment inventories, though growing unbalanced stocks event of prolonged strike will pre-nt usual problems in such in-ances. Tin plate sellers are accept-g orders without specific delivery romises.

Plates . . .

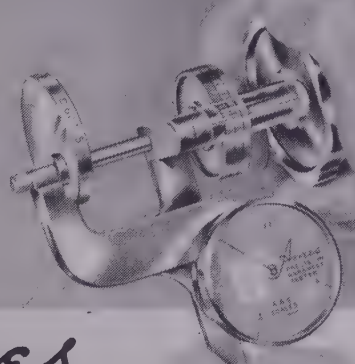
Plate Prices, Page 231

Boston—Plate inventories about ıatch shop backlogs in most in-ances which are heavier for tank ork than for boiler shops. Back-gs in most cases are under 60 days. eliveries previous to suspension in ɔerations were somewhat heavier, ıt all tonnage required for specific ontractual requirements was not ıipped in most instances.

New York—Plate mills at Consho-ɔcken, Pa., and Harrisburg, Pa., con-nue to operate; all other eastern roduction is down. Thus, plate de-and, which has been relatively light l along, is now being centered large-on these mills, with a resultant epping up in their backlogs. To ate pressure has not been too great ecause most fabricators and jobbers ave fair inventories.

Philadelphia—Reflecting the labor tuation, plate movement has dropped ıarply with only Conshohocken and arrisburg, Pa., mills operating in ıis district. Most boiler shops and ıbricators of light tanks have suf-cient tonnage to carry them for ur or five weeks. Shipyards are ell stocked, some with so much they re still trying to dispose of a portion it. Railroad equipment builders so are well supplied.

Chicago—Major tank fabricators ere are operating and are not yet gnificantly affected by the strike, eir inventories amounting to about 5-60 days. Order backlogs are still uite substantial, a major source of usiness being oil storage tank work the Indiana refinery area. Bulk of is work is scheduled for comple-on before the navigation season oses. Among the larger interests, omestic oil tank work constitutes ly a minor fraction of total busi-ess but this type of work is of reat importance to several smaller ops.



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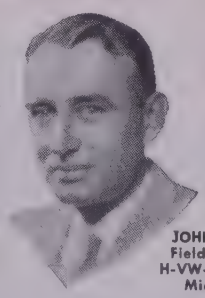

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Field Representative
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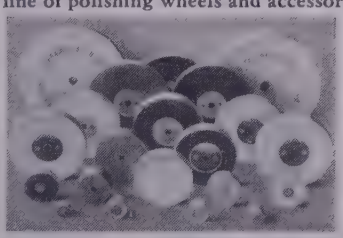

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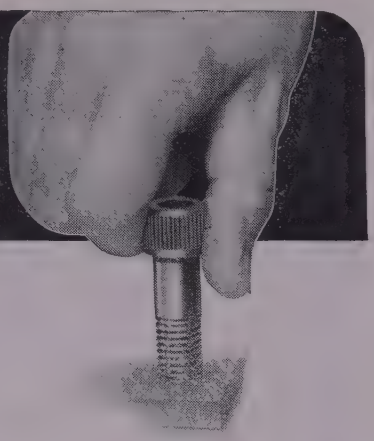

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Structural Shapes . . .

Structural Shape Prices, Page 231

New York—Despite the steel strike, district fabricating shops generally continue in operation. How long they can maintain normal rate under the circumstances depends upon inventories. Should the steel mill tie-up continue for any length of time, most shops would find themselves short on certain sections and probably would have to retard fabrication, if not suspend entirely. Certain fabricators indicate that if the strike continues for another week they will suspend temporarily, after having gotten requirements for certain projects sufficiently worked off.

The fabricating shops of the leading eastern producer are down. The Elmira, N. Y., shop of the American Bridge Co., with an AFL contract, continues to operate.

Boston—Structural steel fabricators are among best situated steel users to withstand prolonged suspension in new tonnage. Most, by filling in from warehouse, could operate for nearly three months or to extent of backlogs. Shops were closed by a six week strike in late summer, but shipments of plain material were not halted; this in part accounts for substantial inventory.

Philadelphia—Demand is riding largely on the momentum engendered prior to the steel strike. However, there is a tapering off. Except for shops of the leading eastern producers, all districts fabricators are operating; there should be little change for at least another week or so. If steel strike continues, some shops may be forced to curtail by that time because of unbalanced inventories.

Pittsburgh — Independent fabricating shops remain in operation. There is no assurance, however, such would be the case over next few weeks because of contract terminations. While most shops have sizable steel inventories, considerable work will be delayed due to unbalanced stocks in respect to desired size specifications, notably in wide flange beams. An unusually large structural tonnage is involved in Pennsylvania of highway bridge jobs, on which bids recently were accepted. John F. Casey Co., Pittsburgh, is low on 5500 tons shapes and 850 tons reinforcing for Tarentum, Pa., Bridge B; Perini & Sons, Boston, low on 3600 tons shapes and 550 tons reinforcing for Frazer Street bridge, Pittsburgh.

Los Angeles — Shutdown of steel mills will not affect structural supplies for some time, for most structural fabricators in this district remain in operation. Availability of merchant steel will determine how long they can continue. While inventories of shapes are sizable, they are not as large as they were earlier this year, for structural shops generally have allowed stocks to drop from a 6-month supply to more realistic levels.

Seattle—Local fabricators are making no important contracts, although estimators are busy on a mass of small jobs, including schools and industrial construction. Stocks of steel are ample for a prolonged shutdown of production facilities, recent deliveries having been expedited.

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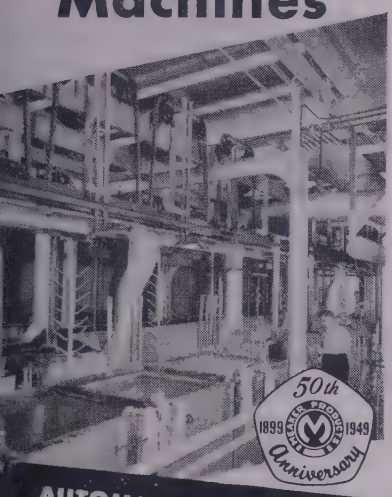

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Tool Steel . . .

Tool Steel Prices, Page 233

Pittsburgh—Tool steel producers, with exception of Universal Cyclops, continue to operate. In some instances, contract termination dates will fall within next two weeks; other producers are operating under indefinite contract extension permitting employees to "walk-out" at will or on varying number of days strike notice. Some improvement in order volume was recorded in September, due in part to the strike threat. Tool steel interests have not experienced a flurry in new orders; in fact, outlook is "bearish" due to depressed production outlook among major consumers. Excluding some specialty items, sellers are offering prompt delivery from mill or warehouse stocks.

Wire . . .

Wire Prices, Page 233

New York — Wire consumers in numerous instances delayed placing orders as a hedge against suspensions in shipments and most of them have inventories under 30 days. There are some curtailments in consumption by those users who are attempting to stretch available steel as far as possible. With improved delivery on wire products last quarter, buyers frequently failed to reinstate tonnage canceled earlier or lift deferments. This policy resulted in a last minute rush for volume which mills were able to only partly meet.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 234

Pittsburgh—Oliver Iron & Steel, Pittsburgh Screw & Bolt and an increasing number of metalworking companies in this district are strike casualties. Only one fastener producer remains in operation and probably will continue so at least to the Oct. 20 contract termination date. Demand for fasteners recorded moderate improvement in September, although most producers operated only 3 or 4 days per week. Relatively heavy customer releases, due at least in part to protective buying, has clouded demand outlook. However, strike of even moderate duration should remedy this situation.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 234

Pittsburgh—Foundry coke stocks are adequate to weather shutdown in beehive and oven coking operations for at least thirty days. Anticipated adverse effect of nationwide steel strike on new demand for castings undoubtedly will force reduction in foundry operations, thereby further extending coke stock position.

Cleveland — Foundries are more concerned over coke supply than they are over pig iron stocks, due to a strike which has closed the Painesville, O., plant of Diamond Alkali Co., the lone producer and major seller of foundry coke in this area. Strikers belong to a United Mine Workers affiliate.

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HAMMERBOARD
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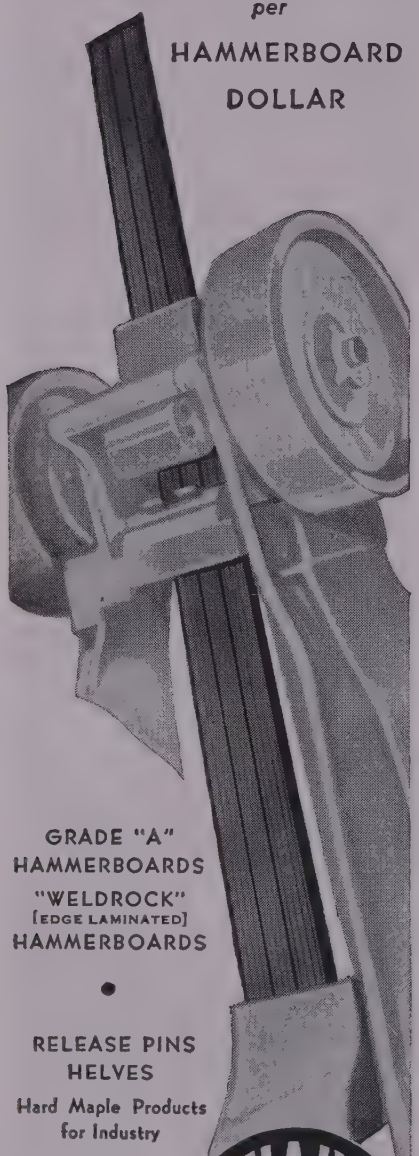

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Warehouse . . .

Warehouse Prices, Page 235

Pittsburgh—Major warehouse interests which are subsidiaries of basic steel producers have shut down. Mixed trend in new order volume is noted among independent distributors with one interest reporting flurry in new orders since Oct. 1; another states average daily shipments have recorded little change. Most distributors have ample stock to meet emergency requirements of regular customers, but have established closer control on order acceptance as a hedge against prolonged steel strike.

New York—Improvement in demand from warehouse is likely to be accelerated the longer mill shipments are suspended. To meet heavier buying, warehouse stocks are in good balance, although some products are in better supply than others. Secondary prices should also become steadier with less shading and freight absorption. Stocks of cold-finished bars are generally heavy.

Philadelphia—District jobbers report a further improvement, as consumers, cut off from mill sources turn to them for supplies. To date, pressure has not been too strong although upon occasion jobbers have felt called upon to keep purchases "within bounds."

Cleveland—With the flow of steel from mills choked off by the steelworkers' strike, consumers are placing increasing dependence on warehouses for material. One warehouse is flooded with demand, some of it coming from far outside its normal territory; another had a heavy additional demand early last week.

Chicago—Warehouses still open are doing a land-office business, although urgency of demand is not as great as it will be if the strike lasts another week or more. Few hardship cases have yet been reported. Call for carbon bars is not particularly strong and roughly two months' supply of the hitherto easily supplied items are in stock. Cold-rolled and galvanized sheets are virtually unobtainable. Structurals and plates are in reasonably good supply with operating warehouses although one major distributor of constructional materials is strike-bound.

Cincinnati—Demand for warehouse steel is fairly heavy, although not in volume anticipated when mills were shut down. Stocks are adequate for normal demand, but could not satisfy a deluge of orders.

Los Angeles — Steel jobbers report no surge of orders—except for sheets, as a result of the steel strike. Demand for sheets was so great that warehouses generally have placed them on allocation to prevent their stocks from being depleted immediately. Demand is expected to increase for all other products as fabricators' inventories are consumed; jobbers are prepared to initiate allocation systems as required.

Seattle—Jobbing trade volume for September was the same as August and was not stimulated by the threat of a mill strike. Inventories are complete except for galvanized sheets which continue the bottleneck, producers being one to two months behind their delivery promises. Some steel shipments from mills were expedited prior to the strike.

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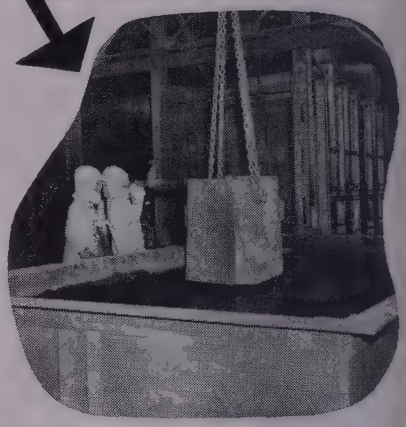
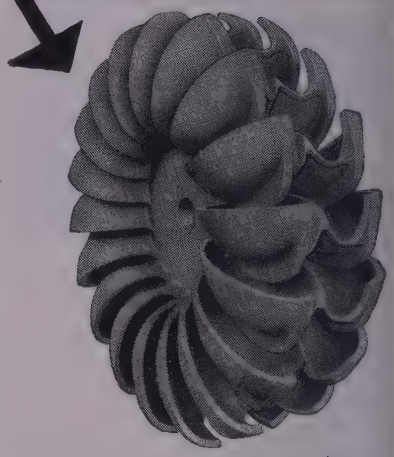
CASTINGS



For Intricate
CASTINGS



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ig Iron . . .

Pig Iron Prices, Page 230

Pittsburgh—Merchant iron shipents from stock were very heavy roughout late September, reflecting creased production schedules among undries serving the plumbing and ating industries as well as accumation of inventory to cover needs ring the steel strike. Merchant on stocks held by producers have en sharply reduced from the relavely high levels reached during ne. Most merchant iron interests ntinue to operate under an infinite contract extension basis. enango Furnace Co. and Hanna rnace Corp. are closed by the rike, but Pittsburgh Coke & Chemal is operating while Sloss Sheffield, oodward Iron, Interlake and several her merchant stacks throughout the untry continue operations.

New York—Three eastern blast furces are still in operation—one at ystic, Mass., another at Swedeland, a., and third at Birdsboro, Pa. With ost steel mills down, there is little mand for basic, but pressure for undry iron continues strong. Should e tie-up in steel and coal continue r any length of time, a spurt in ports of foreign iron may develop.

Boston—District blast furnace is t effected by the steel strike and ntinues to operate piling little iron; oduction last month went into conmption and some tonnage was tak- from stock. Releases are gradu- increasing and some inquiry is kely to develop from districts not rmally served by Mystic.

Philadelphia—Foundries are keepg about as close an eye on coal as ey are on steel, as a shortage of ke could disrupt operations as ickly as a shortage of iron. Most them are fairly well supplied with th at the moment, although only vo furnaces in the district are opating. Due to restricted production r some time past, malleable founries have substantial supplies of on on hand.

Buffalo—With most foundries holdg ample inventories of pig iron, e steel strike is having little effect melting operations. One of the ading merchant iron sellers is shipng to eastern consumers from a aboard storage point. Due to eight costs, it is not profitable to ip into the local area. The tightning in coke supply is curtailing elting operations at the present me more than the steel strike.

Mixed trends are apparent among undries. Jobbing plants are showg better operating schedules; malable plants continue to slump.

Cincinnati — Foundry melt conues at last month's rate. Shortges of coke and iron have not yet veloped from the strike. Some elters had been augmenting stocks, though shipments had been less an requested. Pig iron, especially om southern furnaces, had been ming in steadily before the strike.

St. Louis—Steel strike, which has t affected this area, has produced oderately steeper demand for pig on, particularly among foundries tside this normal shipping region. roduction rate is still slightly above per cent, with one of Koppers' vo blast furnaces down.

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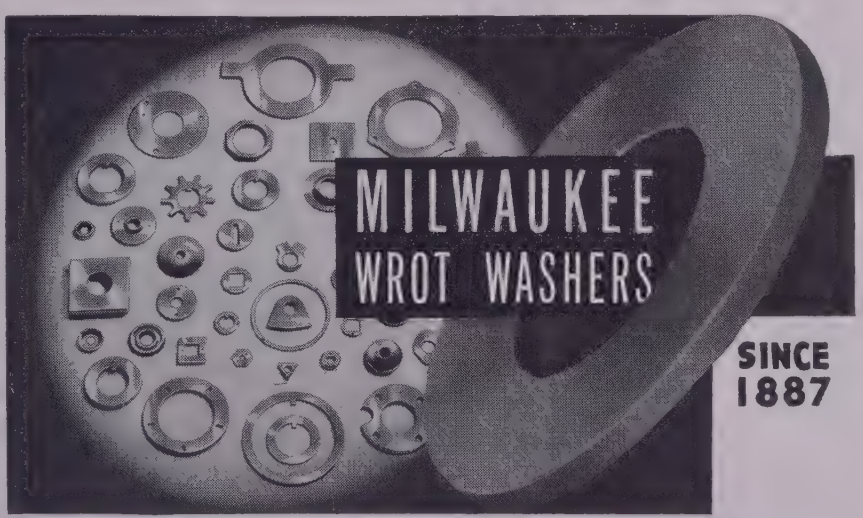

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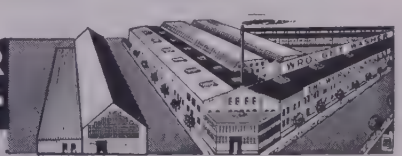

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Scrap . . .

Scrap Prices, Page 238

Philadelphia—District mills, most of them down, are buying no scrap. No. 1 cupola cast has dipped to $35, delivered, on actual business, and has carried with it nominal reduction in several other grades of cast.

Boston—Demand for steelmaking scrap has slackened without price weakness. No. 1 heavy melting steel is $18, shipping point, with some tonnage on order from works still operating which includes two plants in this area. Machine shop and short turnings are $13 and $15, shipping point, for district delivery. Buying of cast is also slower.

New York—Brokers' buying prices on steel scrap are nominally unchanged in quiet trading. An easier undertone has developed in cast iron scrap with all grades, except malleable, quoted $1 lower.

Cleveland—A wait-and-see attitude prevails in the scrap trade. With demand for blast furnace and steelmaking grades at almost a standstill, price raising was out of the question.

Pittsburgh—New scrap commitments are limited to dealer-broker transactions. Allegheny Ludlum, Armco and Weirton Steel continued to accept shipments on old orders last week. This is in contrast to "hold-up" shipping notices received by dealers and brokers from all other steel producers shutdown by steelworkers strike.

Detroit—Scrap market was quick to react to the depressive influence of the steel mill shutdowns, which came a matter of days after large automotive lists closing here met strong support. Last week, however, the entire market except for cast grades was off at least $3 per ton.

Buffalo—Hopes for an early settlement in the steel strike are expressed by dealers who are busy loading cars for delivery to mills. With approximately 25,000 tons of steelmaking grades sold to mills in the two or three weeks immediately preceding the walkout of steelworkers, dealers report brisk activity in their yards. However, if the strike goes beyond two weeks it will be necessary to unload cars to escape the demurrage charge on loaded freight cars. Prices are unchanged with No. 2 heavy melting at $26.

Chicago—Two mills which are still operating have stepped into the vacuum left in the scrap market by the strike and have made purchases. Purchase of No. 1 heavy melting steel for $26 by a nearby mill is not unanimously agreed upon here as setting the market. The scrap involved is coming from a remote area and will not go through local dealers' hands. Several traders indicate a willingness to sell scrap for immediate shipment at this figure. The other known sale was of No. 2 heavy melting scrap for $22 and $23.

Cincinnati—Embargoes on iron and steel scrap at strikebound mills have not weakened prices; on the contrary, some quotations have moved upward. Shipping orders are being received from steelmakers still operating, and foundry demand is active.

Seattle—Bethlehem Pacific Coast Steel Corp. is out of the market for an indefinite period. Prices are unchanged. Prices of cast iorn scrap have advanced to $25 and $27.50 due to current local conditions.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3500 tons, Uris office building, 57th street and Madison avenue, New York, to Harris Structural Steel Co., that city.

1500 tons, Sam Minskoff apartment, Fifth Ave. and 73rd St., New York, to American Bridge Co., Pittsburgh.

1300 tons, Bureau of Public Roads bridge near Coeur d'Alene, Idaho, as follows: 700 tons to Virginia Bridge Co., Roanoke, Va.; 400 tons (cylinder steel) to Consolidated Western Steel Corp., Los Angeles; 200 tons to Columbia Steel Co., San Francisco; Paul Jarvis Inc., Seattle, general contractor, low $871,155.

780 tons, Neo Rotogravеur Printing Co., Weehawken, N. J., to Ingalls Iron Works, Birmingham, Ala.

730 tons, milk distribution plant, Suppiee-Wills-Jones Milk Co., Philadelphia, through McCloskey & Co. to Max Corchin Inc., same city.

500 tons, state bridge, Salem, Mass., to Truscon Steel Co., S. Boston; Burke-Moore Co., Boston, general contractor.

495 tons, apartment, Gramercy Development Corp., 22nd street, New York, to Steel Fabricating Co., that city.

400 tons, Columbus Hospital addition, New York, to Fassler Iron Works, Bronx, that city.

400 tons, field house, Lawrence, N. J., school, to Bethlehem Steel Co.

335 tons, state highway bridge, Berks county, Pennsylvania, to Bethlehem Steel Co.

325 tons, veterans' hospital, Holyoke, Mass., to Waghorn & Brown, representing Bethlehem Fabricators Inc., Bethlehem, Pa.; M. Slotnick, Boston, general contractor.

300 tons, steel piling, bridge, Groveland-Haverhill, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, tainter valves, operating machinery, etc., McNary dam, to Northwest Marine Iron Works, Portland, Oreg., low $72,755 by U. S. Engineer.

270 tons, parking garage, Hotel Properties Inc., New York, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, power plant, Westboro, Mass., to Groisser & Shlager, Somerville, Mass.

200 tons, Oregon state Rogue river bridge, to American Bridge Co., San Francisco; Lindstrom Bros., Portland, Oreg., general contract, $130,958.

165 tons, Our Lady of Senacle School, New York, to Schacht Steel Construction Inc., that city.

150 tons, Standard Oil Co. of California Seattle terminals, to Isaacson Iron Works, Seattle.

140 tons, state bridge, Lancaster and Chester counties, Pennsylvania, to Easton Steel Structures Inc., Easton, Pa.

110 tons, Mercy hospital, Portland, Me., to Bancroft & Martin Co., Portland.

STRUCTURAL STEEL PENDING

5300 tons, Tarentum state bridge, Allegheny and Westmoreland counties, Pennsylvania; John F. Casey, Pittsburgh, low on general contract.

3700 tons, state deck truss bridge, LR 763 sec. 2A, Allegheny county, Pennsylvania; B. Perini & Sons, Framingham, Mass., low on general contract; also low on 7632-B requiring 400 tons.

2600 tons, reconstruction of suspension spans Brooklyn bridge, New York; bids asked.

1500 tons, Sullivan Square viaduct, Boston, due for estimates in November.

1500 tons, estimated, veterans' hospital, Boston; bids due in January.

1000 tons, 1146-foot Chief Joseph dam bridge Columbia river; bids to U. S. Engineer, Se-

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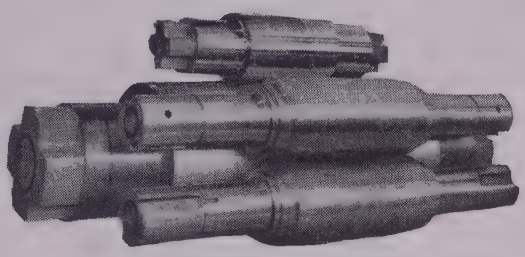

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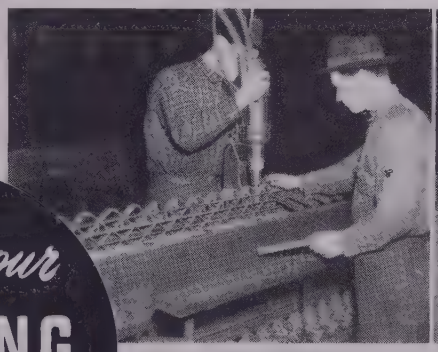

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attle, about Nov. 9.

800 tons, Andrea Tower apartment, East Orange, N. J.; Schurman Construction Co., East Rutherford, N. J., general contractor; plans also have been prepared for another unit, to be known as the Robert Tower, requiring a similar tonnage.

600 tons, bridges, contract one, Olneyville cutoff, Providence, R. I.; M. Gammino Co., Providence, low on general contract.

400 tons, New Stanton state viaduct, Westmoreland county, Pennsylvania; Adam Eidemiller, Greensburg, Pa., low on general contract.

400 tons, three state I-beam bridges, LR 247 sec. 6, Allegheny county; Harrison Construction Co., Pittsburgh, low on general contract.

400 tons, bridge, Elliot street, Boston; bids Oct. 6.

300 tons, bridge, Canterbury-Plainville, Conn.; Campanella & Cardi, Cranston, R. I., low on general contract.

220 tons, state bridge, Bradford county, Pennsylvania; Pinebrook Iron Works, Scranton, Pa., low bidder.

200 tons, Consolidated Freightways warehouse and terminal, Seattle; general contract to John H. Sellen Construction Co., Seattle, $308,553.

140 tons, western extension of state turnpike, sec. 31-GF and sec. 31-F, Westmoreland county, Pennsylvania; bids Oct. 18; also 300 tons of reinforcing steel.

Unstated, Washington state bridge over Snake river; plans in preparation; bids early 1950.

REINFORCING BARS . . .

REINFORCING BARS PLACED

180 tons, University of Idaho building, to Bethlehem Pacific Coast Steel Corp., Seattle.

150 tons, two Washington state highway projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

150 tons, two units of Standard Oil Co. of California Seattle terminals, to Northwest Steel Rolling Mills Inc., Seattle.

100 tons plus, Bureau of Public Roads bridge, Idaho, to Bethlehem Pacific Coast Steel Corp., Seattle; Paul Jarvis Inc., Seattle, general contract.

Unstated, apartment building in Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

135 tons, Chief Joseph dam, Columbia river; bids to U. S. Engineer, Seattle, about Nov. 9.

Unstated, 260-foot Moffett Creek, and 425-foot Tanner creek bridges, Oregon state highway projects; general awards to Watts Construction Co., Portland, Oreg., $77,600 and C. J. Eldon, Portland, $185,689, respectively.

Unstated, addition to cold storage and produce warehouse, for S. A. Postell, Spokane, Wash.; general contract awarded: $400,000 project.

Unstated, Portland, Oreg., baseball stadium and office; George H. Buckler, Portland, apparently low, $886,000.

PLATES . . .

PLATES PENDING

100 tons plus, tunnel lining for Lucky Peak project; bids to U. S. Engineer, Walla Walla, Wash., postponed from Oct. 5 for about 15 days.

Unstated, 1000 lineal feet plus 20 tons steel piling for Chief Joseph dam, Columbia river; bids to U. S. Engineer, Seattle, about Nov. 9.

PLATES PLACED

700 tons, twenty tanks, California Refining Co., Barber, N. J., to Graver Tank & Mfg. Co., Inc., East Chicago, Ind.

PIPE . . .

CAST IRON PIPE PENDING

1200 tons, 6, 8 and 10 inch cast iron pipe, Burlington, Mass.; R. D. Wood & Co. Florence, N. J., low.

550 tons, 6 to 12 inch cast iron pipe, Winthrop, Mass.; bids in Oct. 10.

275 tons, (if all cast iron) 6 and 12 inch Class 150, alternative 10 gage steel dipped and wrapped of 2520 feet of 12 inch; bids to Pullman, Wash.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago, Milwaukee, St. Paul & Pacific, four 1000 hp diesel-electric switching locomotives to Baldwin Locomotive Works, Eddystone Pa.

Duluth, South Shore & Atlantic, three 1500 hp diesel-electric road switching locomotives and three 2000 hp heavy-duty transfer locomotives, to Baldwin Locomotive Works Eddystone, Pa.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

OAKLAND, CALIF.—McGuire & Hester Co. received a $113,354 contract for construction of a water pipeline from East Bay municipal utility district. The district also awarded a $71,995 pipe construction project to O. A. Fogelberg, Lafayette, Calif. Both lines will be laid in Oakland.

GEORGIA

MONTEZUMA, GA.—Spalding Realty Co. has awarded a contract to Cornell-Young Co. Bibb Bldg., Macon, Ga., for manufacturing plant; W. Elliott Dunwody Jr., Bankers Insurance Bldg., Macon, architect.

IDAHO

COEUR D'ALENE, IDAHO—City has been selected as site for proposed $5 million pulp mill for Idaho-Montana Pulp & Paper Co. with headquarters at Missoula, Mont. Option has been taken on a timber tract.

MISSISSIPPI

MERIDIAN, MISS.—Mississippi Power Co. Gulfport, Miss., L. P. Sweatt, president plans a $5.5 million generating plant.

NORTH CAROLINA

LEXINGTON, N. C.—Frank Associates Inc. 1441 Broadway, New York, has acquired 113-acres as site for new rayon weaving plant to cost $1 million.

OHIO

CANTON, O.—City of Canton has sold the old municipal auditorium for $256,111 to an unidentified group represented by Atty. Harvey Creighton, Renkert Bldg., and the city plans to build a new arena-type building costing nearly $1 million.

CLEVELAND—Hexene-Ol Laboratories Inc. has been chartered through George W. Brown vice president-secretary of Saunders, Stivers & Co., investment firm at 446 Terminal Tower. The firm was organized to manufacture and deal in chemicals, etc. Incorporators are R. T. Sawyer Jr., Charles D. Johnson and Glenn E. Offenbacher.

KENT, O.—Clayt Propper, Propper Products Co., announces receipt of new contract calling for design and manufacture of wire and fabric weaving machines to be used in the weaving industry in and near New York. Additional equipment will be used in connection with machinery valued at more than $165,000, and designed and manufactured by Propper Products last year.

NEW PHILADELPHIA, O.—Plans for formation of an industrial building corporation have been approved by the New Philadelphia Chamber of Commerce. The organization i

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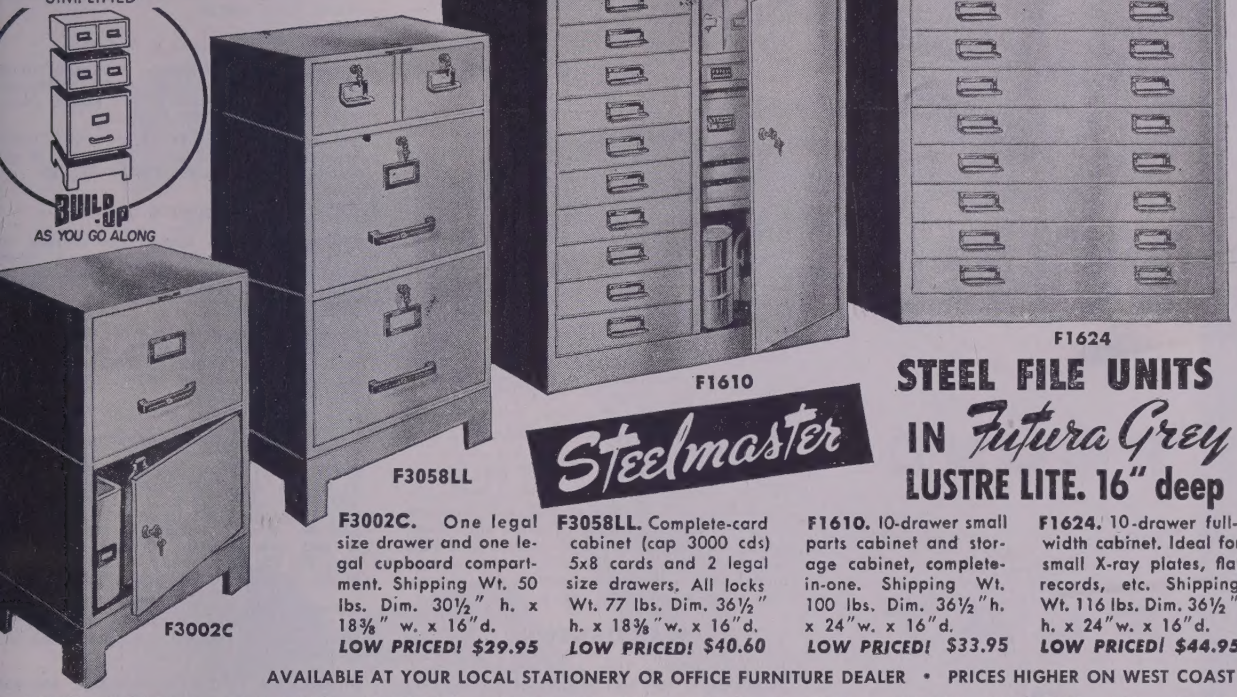

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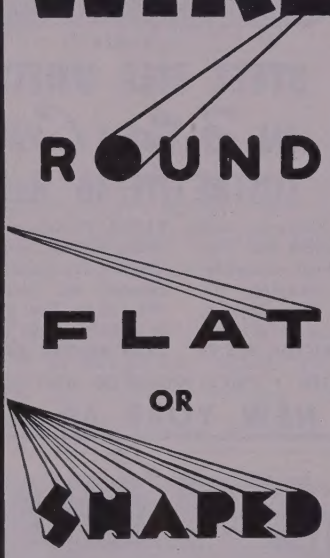

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PAGE STEEL AND WIRE DIVISION
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planning to raise $2.5 million from sale of corporation stock to local residents. The corporation plans two factory buildings.

OKLAHOMA

ENID, OKLA. — Union Equity Co-operative Grain Exchange, E. N. Puckett, general manager, has awarded a $3 million contract to Chalmers Borden Construction Co., Hutchinson, Kans., for an elevator a mile north of present facilities.

OREGON

PORTLAND, OREG.—George H. Buckler is apparently low, $886,000, for construction of a concrete stadium and office for Portland baseball club.

TENNESSEE

FAYETTEVILLE, TENN.—Elk Cotton Mills plans a $200,000 addition; new equipment to be installed, making total cost of all improvements $750,000.

TEXAS

AUSTIN, TEX.—City, Guiton Morgan, city manager, has awarded a contract for $489,830 to J. M. Odom, P. O. Box 774, for a main power plant structure; Burns & McDonnell Engineering Co., Kansas City, Mo., consulting engineer.

HOUSTON—A. O. Smith Corp. of Texas, L. B. Smith, president, plans starting work immediately on a $5 million pipe mill adjacent to Sheffield Steel Corp.'s Houston ship channel plant which will supply welded steel pipe to oil and gas industry; corporation formed and jointly owned by Sheffield Steel Corp. and A. O. Smith Corp., Milwaukee.

WASHINGTON

SEATTLE—Seattle Iron & Metal Corp., 2955 11th Ave. S. W., has awarded a contract for construction of a concrete reinforced combination warehouse and office, to be completely equipped.

SEATTLE—U. S. Navy has begun construction of a $10 million communications station near Arlington, Wash.

SEATTLE — Consolidated Freightways has awarded a contract to John H. Sellen for construction of a freight terminal at Colorado and Hudson streets. Mr. Sellen was low $308,553 when bids were opened June 29.

WALLA WALLA, WASH.—U. S. Engineer has called bids Nov. 2 for metal enclosed unit substation and power center, including equipment, for McNary lock and dam.

ALASKA

ANCHORAGE, ALASKA—Gus Sundborg, consultant, Alaska Development Board, states that governmental approval has been given plans for construction of a $200,000 plant by Permanente Cement Co., construction scheduled for early 1950. It is estimated costs would be reduced 25 per cent by local production.

FERROALLOYS

(*Concluded from Page 235*)

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton t carload, 8c per lb, f.o.b. Suspension Bridge N. Y., freight allowed same as high-carbo ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max. Si 8% max., C 0.5% max.). Contract, ton lot 2" x D, $2.90 per lb of contained Cb, less to $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6% Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lo 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed. 1" x D, 43c per lb of alloy, to lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7% Fe 20% approx.). Contract, carload, packed ½" x 12 M, 16.5c per lb of alloy, ton lo 17.50c, less ton 18.5c. Delivered. Spot, ad 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; to lots 18.00c; less ton lots 19.50c, f.o.b. Niagar Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19% Mn 8-11%). C.l. packed, 14.25c per lb alloy; ton lots 15.75c; less ton lots 17.00 f.o.b., Niagara Falls, N. Y.; freight allowe to St. Louis.

Simanal (Approx. 20% each Si, Mn, Al Lump, bulk, carload 11.00c. Ton lots, bu 11.50c, packed 11.75c. Less ton lots, packe 12.55c per lb of alloy, f.o.b. Philo, O., wi freight not to exceed railroad freight allowe to destination.

Ferrophosphorus (23-25% based on 24% P co tent with unitage of $3 for each 1% of above or below the base); Gross tons per ca load, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, co tained Mo, f.o.b. Langeloth and Washingto Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contain Mo., f.o.b. Langeloth and Washington, P packed in bags containing 20 lb of moly denum, 95.00c.

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JOE, here, has a mighty dependable assistant in this Veeder-Root High-Speed Predetermining Counter. He pre-sets one bank of wheels to the exact number of pieces he needs on any run. Then he starts his high-speed machine *and forgets it* . . . or does other work! No nerve-strain. No eye-strain. No guesswork. *And no waste* . . . for the counter signals him or acts to stop the machine right on the button, without either shortage or surplus.

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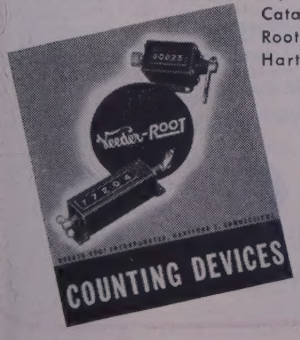

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Behind the Scenes...

Show's Here. Are You?

This week, we probably needn't remind you, is Metal Show Week. Some of you will be reading this in Cleveland, possibly even at the show itself. If so, please accept our invitation to drop by our booth, No. 1419, in the North Hall. Just come down the stairs, turn clear around to your right and it's the third booth on the right. All new and shiny, with comfortable chairs and pleasant surroundings, to say nothing, of the people. At last count Rand Ebersole, who is in charge of people from here who are going to be at the show, said there will be about 70 people from the Penton Publishing Co. in attendance off and on during the week. Nearly all our editors and business staff will be there, and you can be sure of a warm welcome. If by chance you're still at home when you read this, better plan to look us up when you arrive. And if you won't be able to make it this year, we'll look for you next year. In the meantime, you can be sure the editors will be busily engaged in picking up all that's new and important at the show itself and in the many technical sessions so you'll be informed.

Back a Half Century

Fifty years ago, in our issue of October 19, 1899, the big news was the deal made by the Rockefeller interests which practically sewed up all the lake shipping capacity, increased the rate by 25c per ton, and assured a substantial increase in income to all shippers for the 1900 shipping season. Our editor wrote an editorial congratulating the shippers on this "master stroke". These days, the more immediate result would probably be a Congressional investigation and an injunction from the antitrust division of the Department of Justice. We also note in that issue a group including R. B. Mellon, A. W. Mellon, and W. H. Donner formed a new steel company at Pittsburgh; President C. M. Schwab of the Carnegie Steel Co. made a speech at Loretto, Pa., where he unveiled the bronze statue of Father Gallitzin, and the Monessen Foundry & Machine Co., Monessen, Pa., is in the market for a 48-inch radial drill, second-hand preferred.

Clear Air

We had the opportunity of a lifetime last week. Took an air trip from Cleveland to Pittsburgh, over the tri-state area of Western Pennsylvania, Eastern Ohio, and Northern West Virginia. That's not a particularly new trip for us, since we've made it literally hundreds of times on land and in the air. But never before have we had such a clear view. All the smoke was gone, skies were clear blue and we can report that it is really a tremendous sight. Of course we hope that few people ever have that opportunity, because it was made possible only by the fact that all mills were down, due to the steel strike. Even with the anti-smoke ordinances in operation, there's always a haze over Pittsburgh which cuts the view considerably. We know that the smoke laws have gone a long way toward clearing the smoke and smog from the valleys of steel and coal, but no smoke law will ever be as effective as a strike. In a way it's a sorry sight, but it makes for some beautiful scenery. Any of you photographers who want to get a good aerial view of parts of that territory —now's your chance!

Ad Cruising

It's time to take another cruise through our advertising pages and see what we can find to talk about. We're suggesting this particularly because we want to mention some of the many outstanding advertising jobs we saw last week in the book. Like, for instance, the 72 presses photographed and put into that 2-page spread by Hydraulic Press Mfg. Co. That was quite a thought provoking layout, with good copy. And we liked that" may we raise our voice" copy of E. F. Houghton—with case studies of cost-saving accomplished through the use of their products. And for informative copy, how about the three pages on Kaiser Aluminum, with all the data on the new 150S aluminum alloy? And lest we be accused of favoring the larger advertisers, let us point out that good jobs are being done in less than full pages, too. Take for example the ad of Washington Steel Corp. last week, where they point out how you can save money by buying their stainless, strictly on a cents per pound basis. The advertisers these days are really conscious of your efforts to reduce costs—and they're doing their best to help you out!

Shrdlu

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STEEL

Vol. 125—No. 16 October 17, 1949

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